STEREO INTEGRATED AMPLIFIER

A-94

SERVICE MANUAL

KENWOOD

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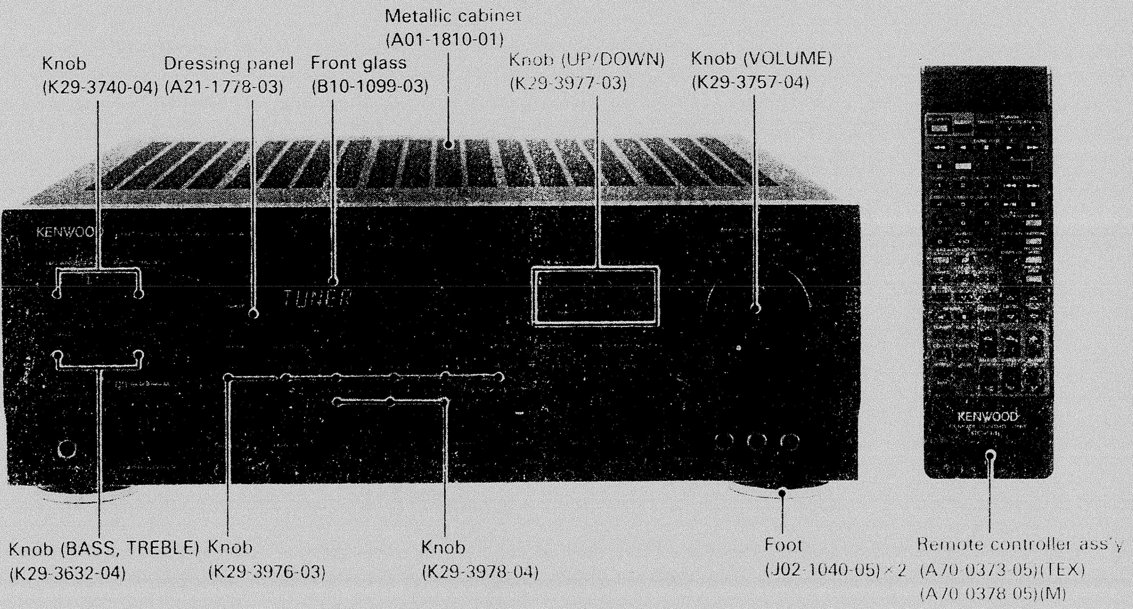
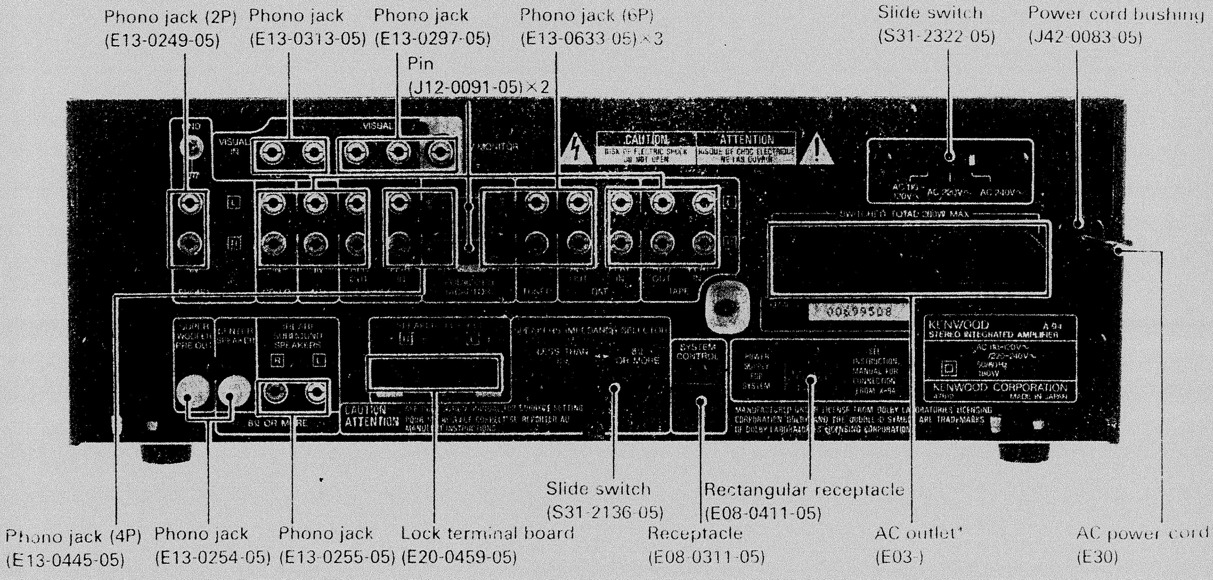
B51-4187-00(S)1953


Metallic cabinet (A01-1810-01)
Knob (K29-3740-04)
Dressing panel (A21-1778-03)
Front glass (B10-1099-03)
Knob (UP/DOWN) (K29-3977-03)
Knob (VOLUME) (K29-3757-04)
Knob (BASS, TREBLE) (K29-3632-04)
Knob (K29-3976-03)
Knob (K29-3978-04)
Foot (J02-1040-05)×2
Remote controller ass'y (A70-0373-05)(TEX) (A70-0378-05)(M)
KENWOOD
TUNER


Phono jack (2P) (E13-0249-05)
Phono jack (E13-0313-05)
Phono jack (E13-0297-05)
Pin (J12-0091-05)×2
Phono jack (6P) (E13-0633-05)×3
Slide switch (S31-2322-05)
Power cord bushing (J42-0083-05)
Slide switch (S31-2136-05)
Rectangular receptacle (E08-0411-05)
Phono jack (4P) (E13-0445-05)
Phono jack (E13-0254-05)
Phono jack (E13-0255-05)
Lock terminal board (E20-0459-05)
Receptacle (E08-0311-05)
AC outlet* (E03-)
AC power cord* (E30)
CAUTION
ATTENTION
KENWOOD
STEREO INTEGRATED AMPLIFIER
KENWOOD CORPORATION
MADE IN JAPAN

CAUTION:

After completing repairs, be sure to restore the Insulating Sheets to their original positions.

*Refer to parts list on page 42

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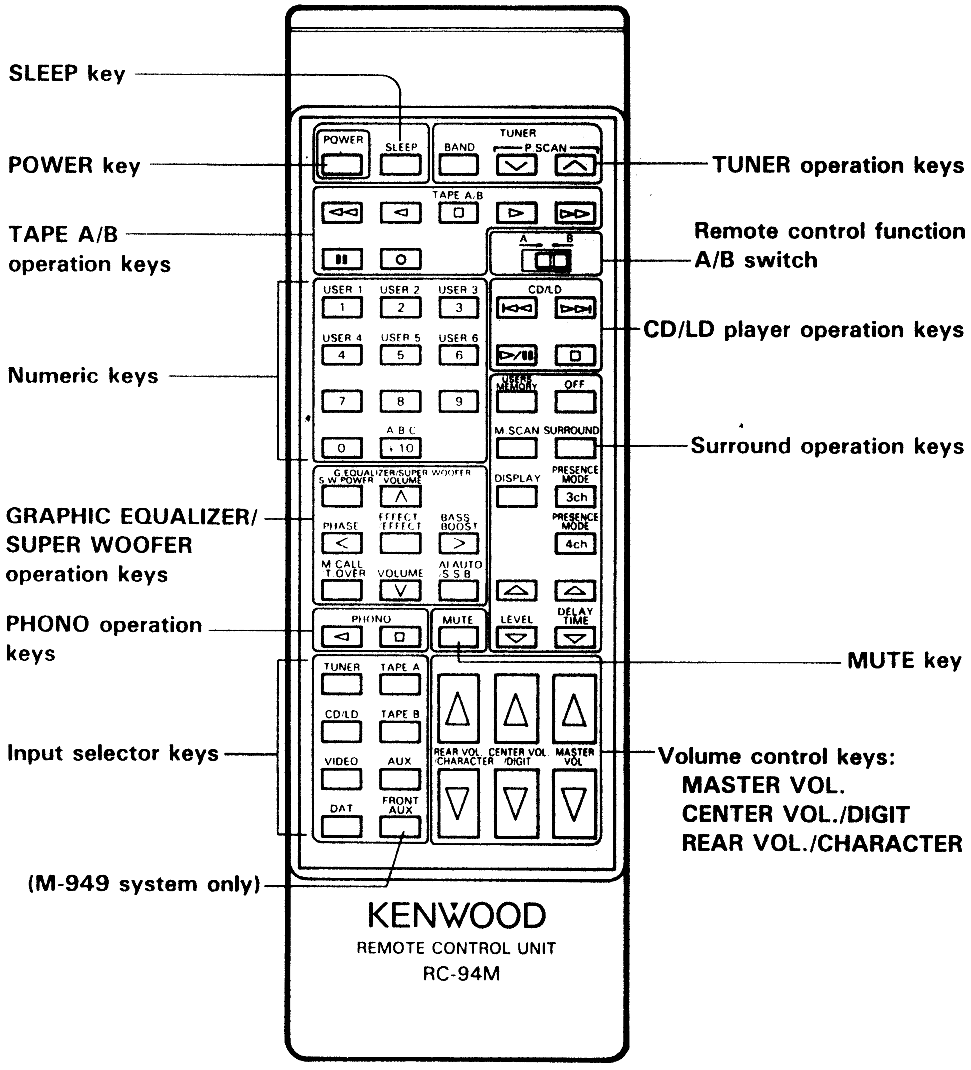
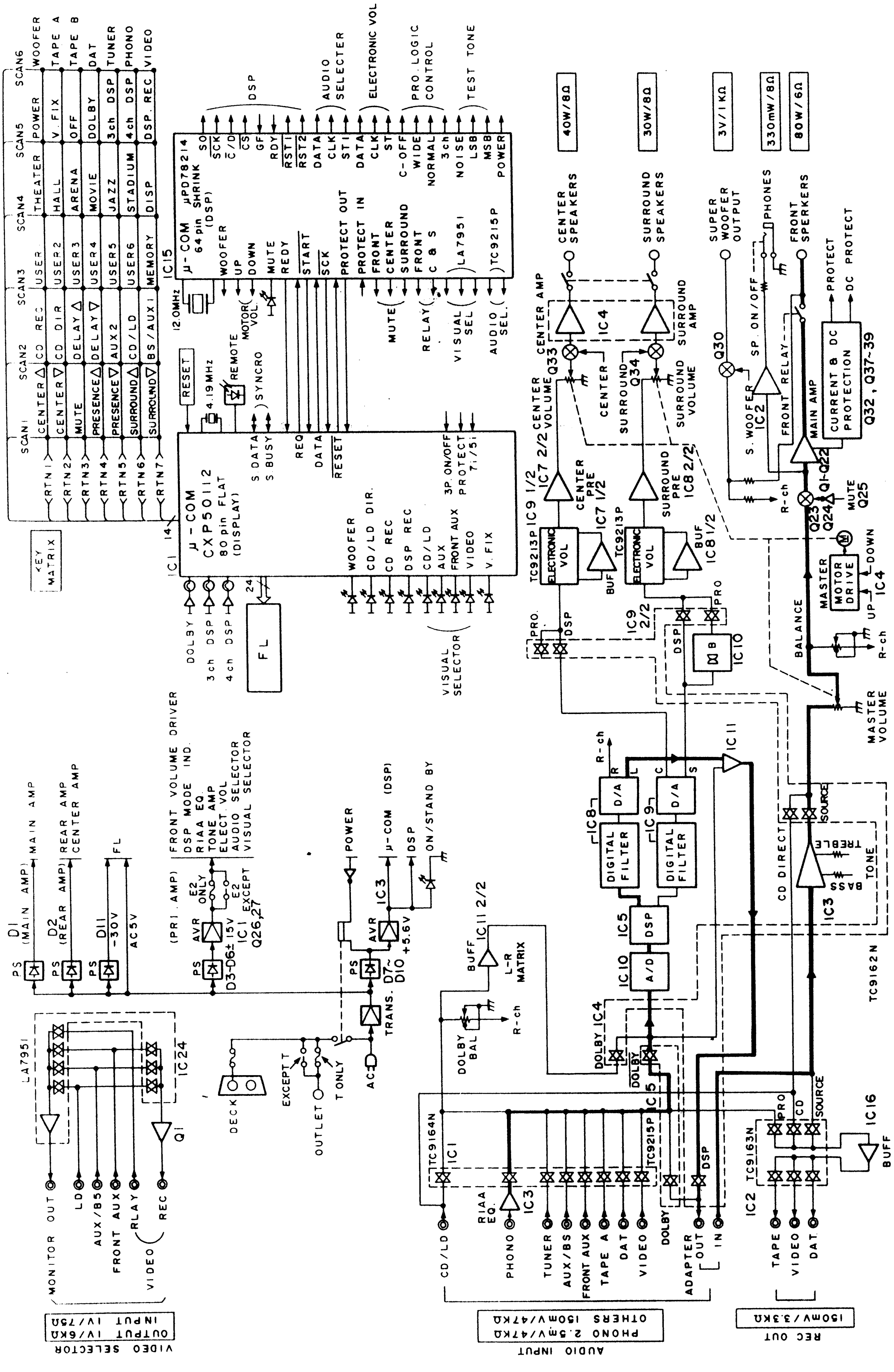
REMOTE CONTROL UNIT


SLEEP key
POWER key
TAPE A/B operation keys
Numeric keys
GRAPHIC EQUALIZER/ SUPER WOOFER operation keys
PHONO operation keys
Input selector keys
(M-949 system only)
TUNER operation keys
Remote control function A/B switch
CD/LD player operation keys
Surround operation keys
MUTE key
Volume control keys:
MASTER VOL.
CENTER VOL./DIGIT
REAR VOL./CHARACTER
POWER
SLEEP
BAND
TUNER
P.SCAN
TAPE A.B
A
B
USER 1
USER 2
USER 3
USER 4
USER 5
USER 6
CD/LD
USER MEMORY
OFF
M.SCAN
SURROUND
A B C
+10
G.EQUALIZER/SUPER WOOFER
S.W POWER
VOLUME
DISPLAY
PRESENCE MODE
3ch
PHASE
EFFECT
BASS BOOST
4ch
M.CALL T.OVER
VOLUME
AI AUTO S.S.B
PHONO
MUTE
LEVEL
DELAY TIME
TUNER
TAPE A
CD/LD
TAPE B
VIDEO
AUX
DAT
FRONT AUX
REAR VOL /CHARACTER
CENTER VOL /DIGIT
MASTER VOL
KENWOOD
REMOTE CONTROL UNIT
RC-94M

BLOCK DIAGRAM


SCAN1
SCAN2
SCAN3
SCAN4
SCAN5
SCAN6
CENTER△
CENTER▽
MUTE
PRESENCE△
PRESENCE▽
SURROUND△
SURROUND▽
CD REC
CD DIR
DELAY△
DELAY▽
AUX2
CD/LD
BS/AUX1
USER
USER2
USER3
USER4
USER5
USER6
MEMORY
THEATER
HALL
ARENA
MOVIE
JAZZ
STADIUM
DISP
POWER
V.FIX
OFF
DOLBY
3ch DSP
4ch DSP
DSP. REC
WOOFER
TAPE A
TAPE B
DAT
TUNER
PHONO
VIDEO
RTN1
RTN2
RTN3
RTN4
RTN5
RTN6
RTN7
KEY MATRIX
IC1
14
μ-COM
CXP50112
80 pin FLAT
(DISPLAY)
RESET
4.19MHz
REMOTE
SYNCRO
S DATA
S BUSY
REQ
DATA
RESET
3P. ON/OFF
PROTECT
7i/5i
WOOFER
CD/LD DIR.
CD REC
DSP REC
CD/LD
AUX
FRONT AUX
VIDEO
V.FIX
VISUAL SELECTOR
DOLBY
3ch DSP
4ch DSP
24
FL
IC15
12.0MHz
μ-COM
μPD78214
64 pin SHRINK
(DSP)
WOOFER
UP
DOWN
MUTE
REDY
START
SCK
PROTECT OUT
PROTECT IN
FRONT
CENTER
SURROUND
FRONT
C & S
LA7951
TC9215P
MOTOR VOL
MUTE
RELAY
VISUAL SEL
AUDIO SEL.
SO
SCK
C/D
CS
GF
RDY
RST1
RST2
DATA
CLK
STI
DATA
CLK
ST
C-OFF
WIDE
NORMAL
3ch
NOISE
LSB
MSB
POWER
DSP
AUDIO SELECTER
ELECTRONIC VOL
PRO.LOGIC CONTROL
TEST TONE
40W/8Ω
30W/8Ω
3V/1kΩ
330mW/8Ω
80W/6Ω
CENTER SPEAKERS
SURROUND SPEAKERS
SUPER WOOFER OUTPUT
PHONES
FRONT SPERKERS
PROTECT
DC PROTECT
CENTER AMP
IC4
SURROUND AMP
Q33
Q34
Q30
SP. ON/OFF
FRONT RELAY
CENTER VOLUME
CENTER
SURROUND
SURROUND VOLUME
S. WOOFER
IC2
MAIN AMP
CURRENT & DC PROTECTION
Q32, Q37-39
IC7 2/2
IC7 1/2
IC9 1/2
CENTER PRE
SURROUND PRE
IC8 2/2
R-ch
Q1-Q22
Q23
Q24
MUTE
Q25
TC9213P
ELECTRONIC VOL
BUF
IC8 1/2
MASTER MOTOR DRIVE
UP
DOWN
IC4
R-ch
BALANCE
PRO.
DSP
IC9 2/2
PRO
IC10
B
MASTER VOLUME
R-ch
R
L
C
S
D/A
IC8
IC9
DIGITAL FILTER
IC11
IC5
DSP
IC10
A/D
SOURCE
TREBLE
TONE
BASS
CD DIRECT
IC3
TC9162N
D1 (MAIN AMP)
D2 (REAR AMP)
D11 -30V
AC5V
(PRI. AMP)
AVR
E2 ONLY
E2 EXCEPT
15V
IC1
Q26, 27
D3-D6±
PS
MAIN AMP
REAR AMP
CENTER AMP
FL
FRONT VOLUME DRIVER
DSP MODE IND.
RIAA EQ.
TONE AMP
ELECT. VOL
AUDIO SELECTOR
VISUAL SELECTOR
POWER
μ-COM (DSP)
DSP
ON/STAND BY
IC3
AVR
+5.6V
D7~D10
TRANS.
AC
T ONLY
EXCEPT T
OUTLET
DECK
IC11 2/2
BUFF
L-R MATRIX
DOLBY BAL
R-ch
DOLBY
IC4
IC5
LA7951
IC24
Q1
MONITOR OUT
LD
AUX/BS
FRONT AUX
RLAY
VIDEO
REC
TC9164N
IC1
TC9215P
RIAA EQ.
IC3
CD/LD
PHONO
TUNER
AUX/BS
FRONT AUX
TAPE A
DAT
VIDEO
DOLBY
DSP
ADAPTER
OUT
IN
IC2
TC9163N
PRO
CD
SOURCE
IC16
BUFF
TAPE
VIDEO
DAT
VIDEO SELECTOR
OUTPUT 1V/6kΩ
INPUT 1V/75Ω
AUDIO INPUT
PHONO 2.5mV/47kΩ
OTHERS 150mV/47kΩ
REC OUT
150mV/3.3kΩ

CIRCUIT DESCRIPTION

DSP CIRCUIT

1. INTRODUCTION

The digital signal processor (DSP) processes a digitized signal digitally to realize the desired functions.
With the spread of digital audio, many audio digital signal processors have been developed recently.
At present, the audio digital signal processor is primarily used for the following:
1) Digital filter (graphic equalizer and tone control)
2) Sound field control (hall sound creation)
The outline of the digital signal processor used for the sound field control in step ❷ is described below.

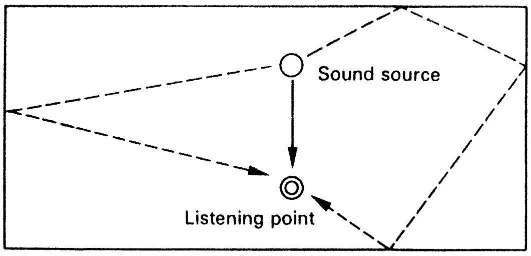


Fig. 1 Actual Sound Field

2. ACTUAL SOUND FIELD PROPERTY AND ITS MODELING

2-1 Sound Field Component

The sound field peculiar to a concert hall consists of ❶ a direct sound, ❷ an initial reflected sound, and ❸ a reverberated sound. The direct sound reaches the listening point directly from the sound source. The initial reflected sound reaches the listening point about 50 ms after being reflected off a wall or the ceiling several times. The reverberated sound is a higher-order reflected sound that is heard as a continuous sound without a sense of direction.
Figure 1 shows the conduction status of a reflected sound. Figure 2 shows the response at the listening point when a short sound is used as the sound source.

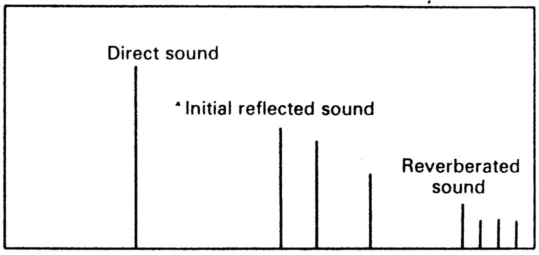


Fig. 2 Short-Sound Response

2-2 Actual Hall Sound

The actual sound characteristics of a concert hall are represented by an echo pattern (short-sound response) and directional pattern. The characteristic examples are shown in Figures 3 and 4.

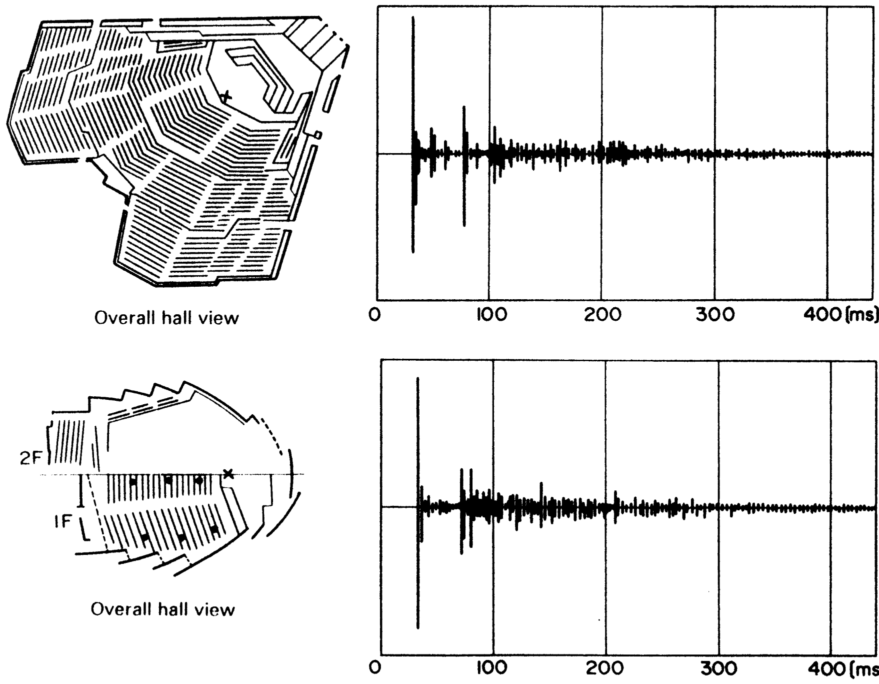


Fig. 3 Echo Pattern

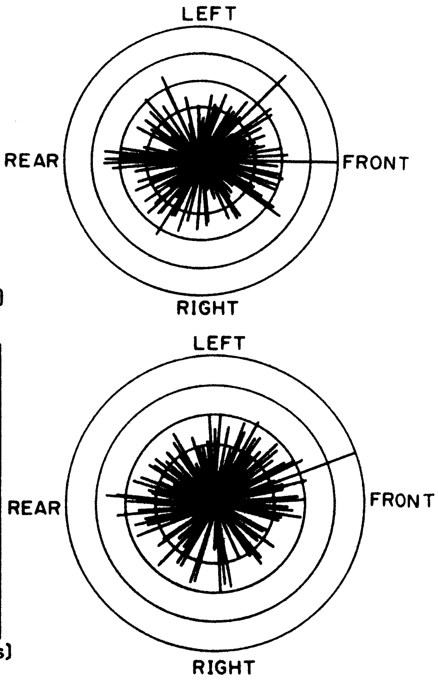


Fig. 4 Directional Pattern

CIRCUIT DESCRIPTION

2-3 Sound Field Characteristic Modeling

To reproduce a hall sound with a digital signal processor, the sound field characteristic are modeled according to the functions of the digital signal processor, as described below.

1) Extract pulses characterizing the hall from the echo pattern shown in Figure 3.
2) Distribute the speakers used in accordance with the directional pattern shown in Figure 4.

Figures 5 and 6 show the modeled echo pattern and directional pattern. The speaker arrangement when four channels are used and the echo patterns reproduced by each speaker are shown in Figures 7 and 8.

Only two or three front speakers may be used to control the sound field more easily. As a result, a wider sound field can be obtained by filtering a reverberated signal at the back and outputting the signal from the front. Figure 9 shows the sound field range in this case.

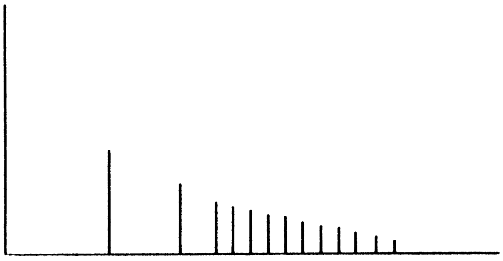


Fig. 5 Modeled Echo Pattern

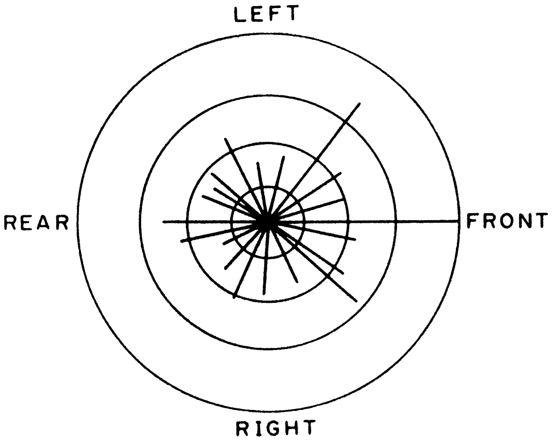


Fig. 6 Modeled Directional Pattern

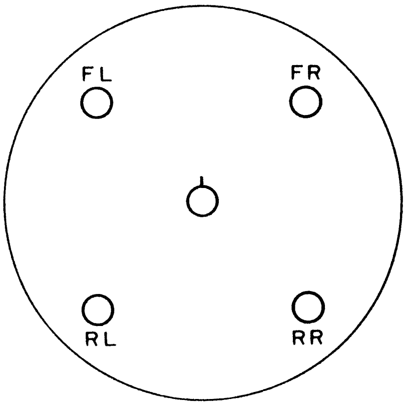


Fig. 7 Speaker Arrangement and Sound Field Range

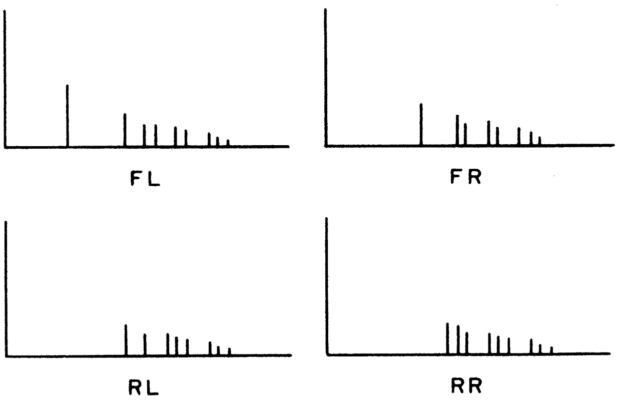


Fig. 8 Speaker Echo Patterns

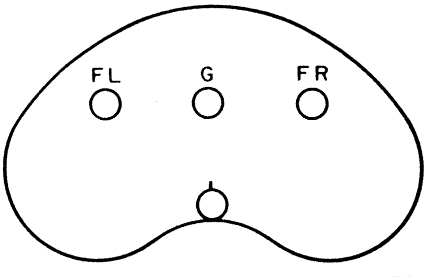


Fig. 9 Sound Field Range in Front Mode

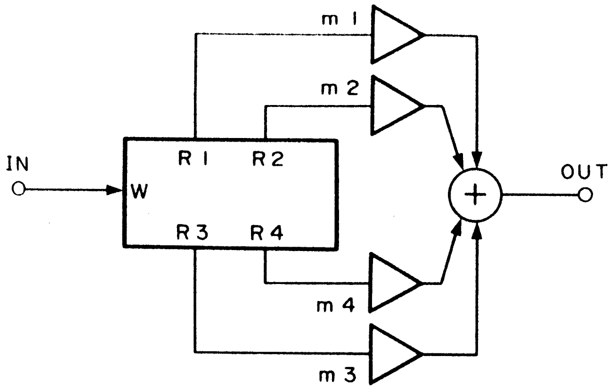
CIRCUIT DESCRIPTION

3. PROCESSING USING DIGITAL SIGNAL PROCESSOR

The sound field characteristics of the hall described in the preceding section are realized with a digital signal processor as explained below.

3-1 Initial Reflected Sound and Reverberated Sound

The basic components and echo patterns used to simulate the sound field of a hall are shown in Figures 10 through 12. Figure 10 shows the delay device that reproduces the initial reflected sound. A reverberated signal is reproduced using the reverberation system of a shredder. The reverberation system consists of a comb filter, shown in Figure 11, and an all-pass filter, shown in Figure 12.



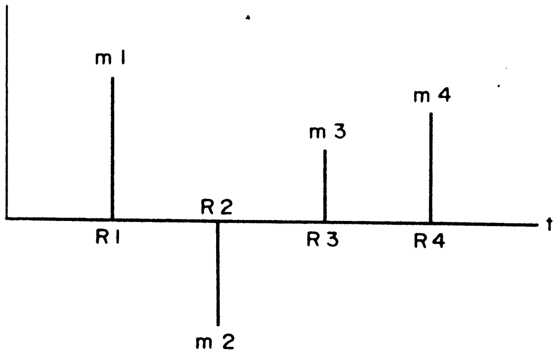
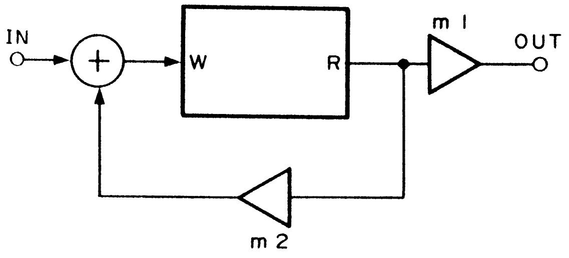


Fig. 10 Delay Device



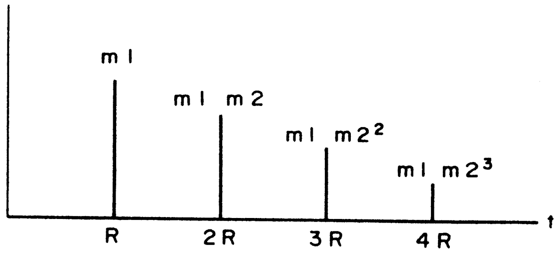
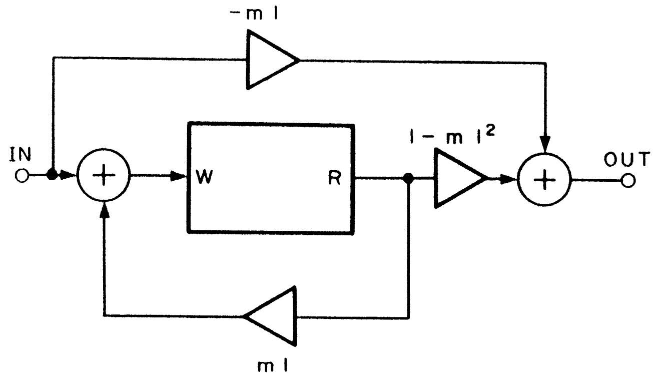


Fig. 11 Comb Filter



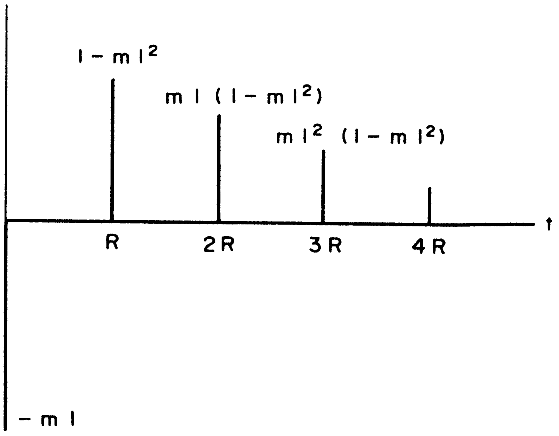


Fig. 12 All-Pass Filter

CIRCUIT DESCRIPTION

3-2 Signal Processing Based on Signal Flow

Figure 13 shows a signal flow example when the sound field in a concert hall is reproduced with two front channels and two rear channels (4 channels in total) and four speakers based on the components in the preceding section.

The input signal for the left and right channels branches into two paths. One is output to the front left and right channels as a direct sound. The other path is used to reproduce an indirect sound. The signal path in which the indirect sound is reproduced produces an L + R mono signal to simplify the processing. The indirect sound can also produce an attenuated high-frequency component characteristic by repeating the reflection and scattering on a wall, floor, or ceiling. In block 1, a low-pass filter is thus constituted to eliminate the high-frequency components. In the signal flow shown in Figure 13, this signal processing is done by a primary IIR digital filter. The signal passing through the low-pass filter is input to initial reflected sound reproduction block 2. Three initial reflected sounds are then reproduced. Two initial reflected sounds are output to the front left and right channels. One initial reflected sound is input to block 3 to reproduce a reverberated sound. Block 3 uses the partially changed reverberation system of the shredder described in section 3-1. The reverberated sound is reproduced in block 3. The output signal of block 3 is input to block 4 and delayed relative to the front and rear left and right channels. The resultant signal is output to each channel.

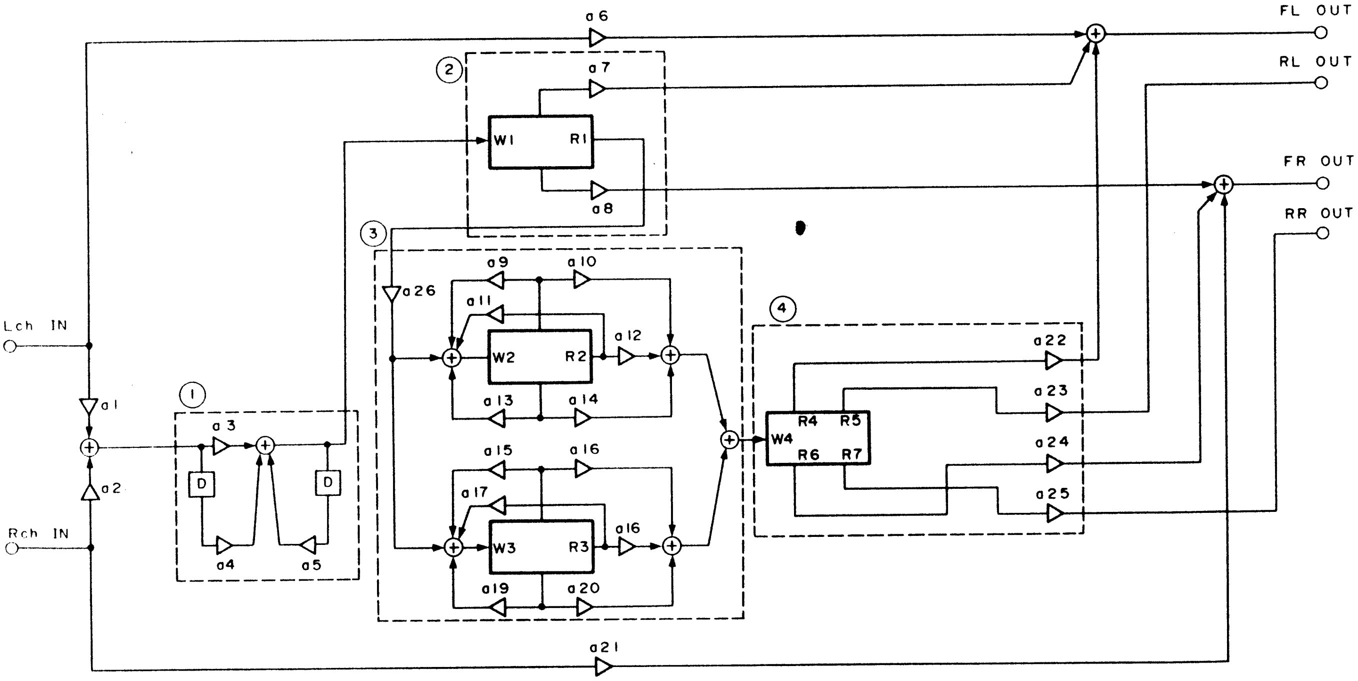
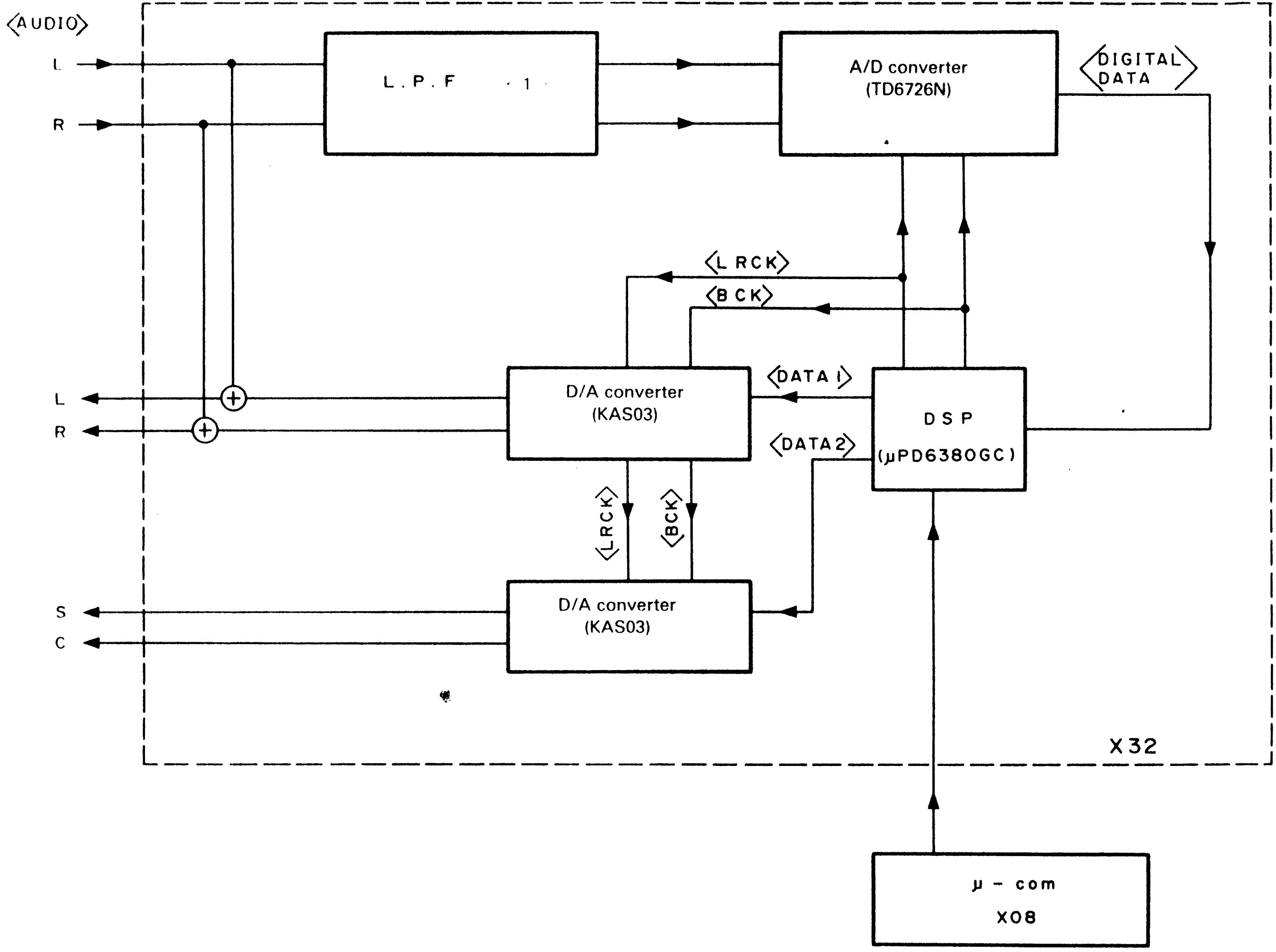


Fig. 13 Signal Flow in Concert Hall

During the above signal processing, various coefficients are used in each block in the course of signal flow. Various parameters such as reverberation time, low-pass filter cut-off frequency, and direct sound-to-indirect sound ratio, as well as initial reflected sound and reverberated sound can be adjusted by altering these coefficients. These parameters can correspond to the environment used or the reproduced software information.

CIRCUIT DESCRIPTION

X32-1710 Block Diagram



AUDIO
L
R
L.P.F <1>
A/D converter (TD6726N)
DIGITAL DATA
LRCK
BCK
L
R
D/A converter (KAS03)
DATA 1
DATA 2
DSP (µPD6380GC)
LRCK
BCK
S
C
D/A converter (KAS03)
X32
µ - com
X08

(1) Block Description

(i) Low-pass filter (LPF) <1>

Cut-off frequency fc is 15 kHz. The voltage level is −70 dB or more at 32 kHz to prevent cyclical noise in a 7-degree Tchebychev low-pass filter and analog-to-digital converter.

(ii) A/D converter (TD6726N)

Sixteen-bit integrating analog-to-digital converter. This converter has an internal sample and hold circuit. The output is a 2's complement.

(iii) D/A converter

The digital-to-analog converter uses two KAS03s consisting of a hybrid integrated circuit (HIC), and has a 4-channel output.

The KAS03 includes a digital filter and 16-bit SH5807. The digital-to-analog converter includes a µPD6376, and an +8 dB amplifier and low-pass filter (3-degree) that adjust the input and output gains of the X32-1710.

(2) Operation

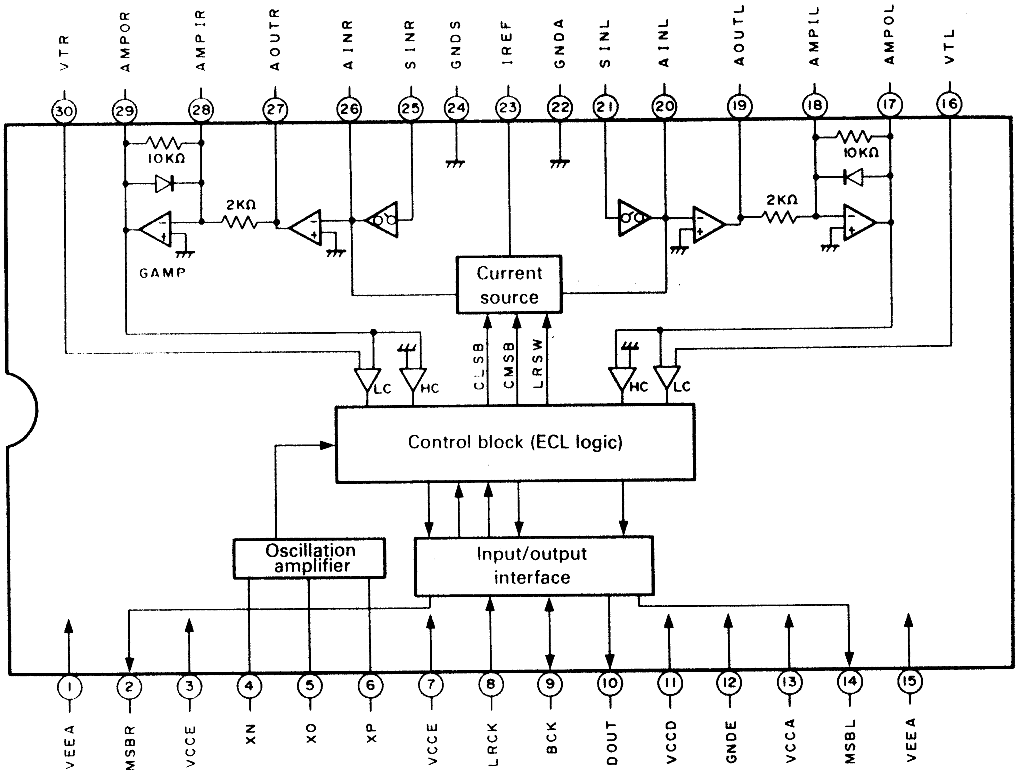
- Sampling frequency fs = 32 kHz
- A/D converter MCK = 67.7376 MHz
  Digital signal processor MCK = 24.576 MHz
  D/A converter MCK = 12.288 MHz

The D/A converter MCK frequency is obtained by halving the 24.576 MHz frequency.

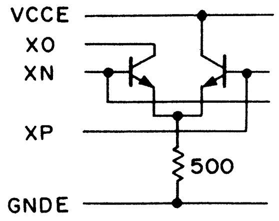
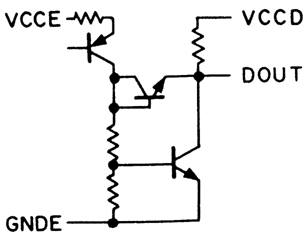
(i) The front channel output signal is produced when the output signal for which the sound field is controlled by the digital signal processor and the through data are added.

CIRCUIT DESCRIPTION

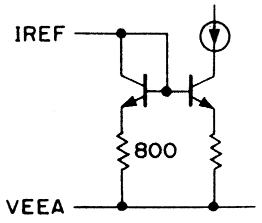
Block Diagram


VTR
AMPOR
AMPIR
AOUTR
AINR
SINR
GNDS
IREF
GNDA
SINL
AINL
AOUTL
AMPIL
AMPOL
VTL
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
10KΩ
2KΩ
GAMP
10KΩ
2KΩ
Current source
CLSB
CMSB
LRSW
LC
HC
HC
LC
Control block (ECL logic)
Oscillation amplifier
Input/output interface
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
VEEA
MSBR
VCCE
XN
XO
XP
VCCE
LRCK
BCK
DOUT
VCCD
GNDE
VCCA
MSBL
VEEA

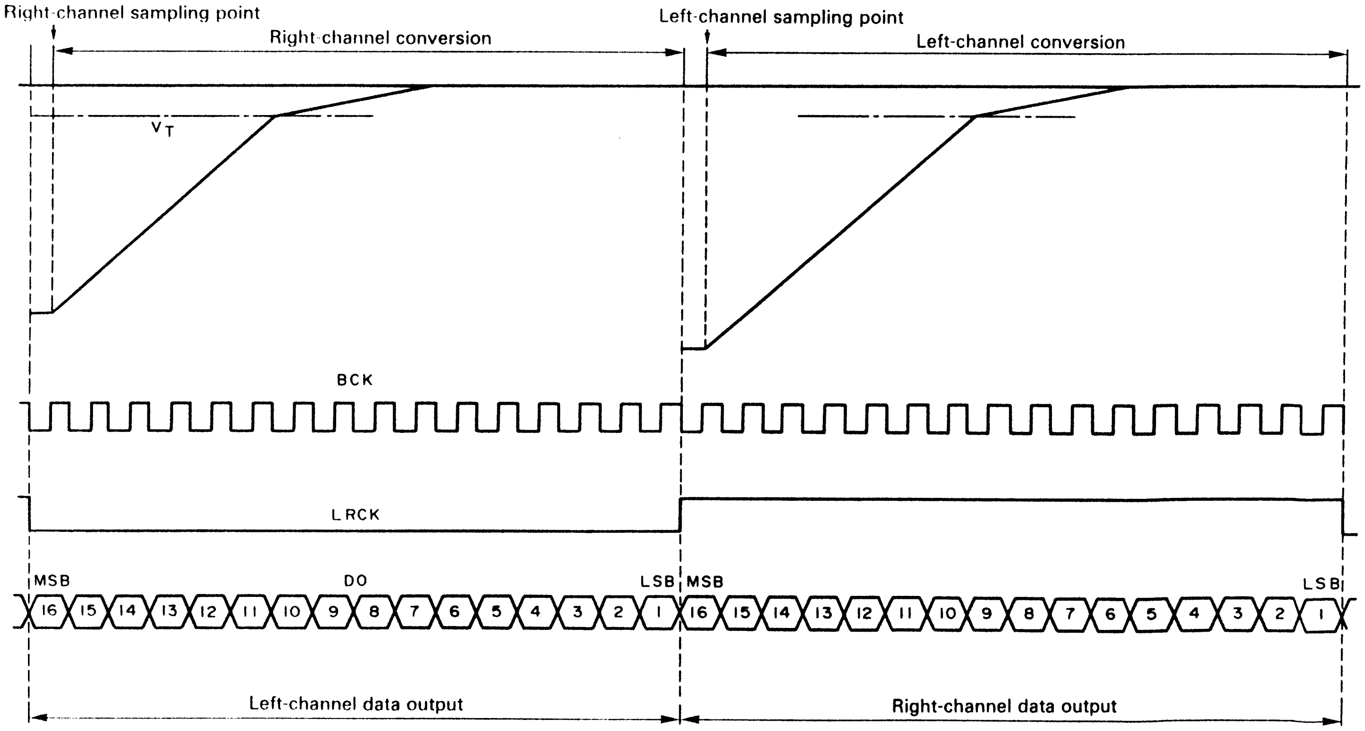
Pin Functions

Pin No.	Symbol	I/O	Description	Remarks
1	ΔVEEA	—	Analog negative supply voltage (−5 V)	
2	MSBR	O	Right-channel MSB signal output. (Output in offset binary codes.) MSB "1" → −1 V, "0" → +1 V	
3	VCCE	—	ECL logic positive supply voltage (+5 V)	
4	XN	I	Oscillation amplifier input/output.	 VCCE XO XN XP 500 GNDE
5	XO	O	A Colpitts oscillator can be easily configured by connecting a coil, capacitor, and resistor to the crystal oscillator.	
6	XP	I		
7	VCCE	—	ECL logic positive supply voltage (+5 V)	
8	LRCK	I	LR clock input	
9	BCK	I	Bit clock input	
10	DOUT	O	Digital audio data output. (Synchronized on the falling edge of the BCK signal for MSB data first-out operation.)	 VCCE VCCD DOUT GNDE
11	VCCD	—	Digital positive supply voltage (+5 V)	
12	GNDE	—	ECL logic ground	

CIRCUIT DESCRIPTION

Pin No.	Symbol	I/O	Description	Remarks
13	VCCA	—	Analog positive supply voltage (+5 V)	
14	MSBL	O	Left-channel MSB signal output. (Output in offset binary codes.) MSB "1" → −1 V, "0" → +1 V	
15	VEEA	—	Analog negative supply voltage (−5 V)	
16	VTL	I	Left-channel comparator reference voltage	
17	AMPOL	O	Left-channel DC gain amplifier output	
18	AMPIL	I	Left-channel DC gain amplifier input	
19	AOUTL	O	Left-channel integrating amplifier output	
20	AINL	I	Left-channel integrating amplifier input	
21	SINL	I	Left-channel audio analog signal input	
22	GNDA	—	Analog ground	
23	IREF	I	Integrating reference current input	 IREF 800 VEEA
24	GNDS	—	Analog signal ground	
25	SINR	I	Right-channel audio analog signal input	
26	AINR	I	Right-channel integrating amplifier input	
27	AOUTR	O	Right-channel integrating amplifier output	
28	AMPIR	I	Right-channel DC gain amplifier input	
29	AMPOR	O	Right-channel DC gain amplifier output	
30	VTR	I	Right-channel comparator reference voltage	

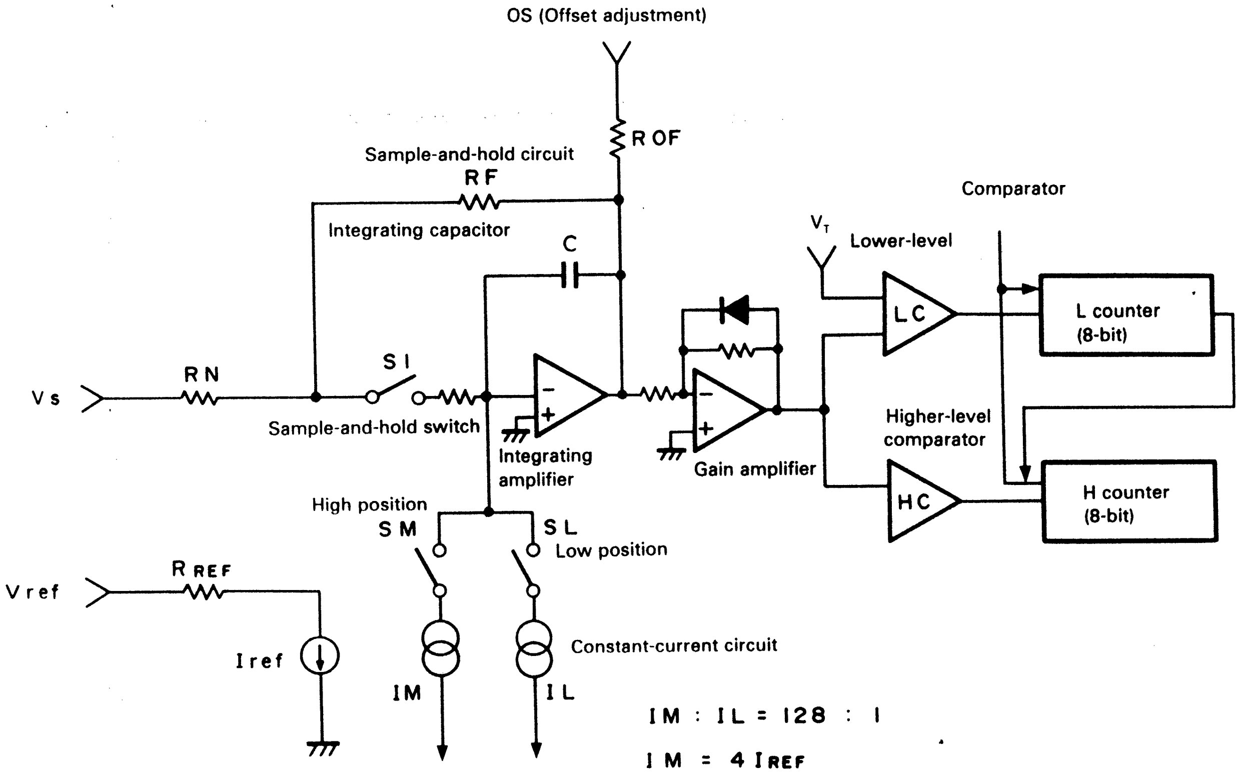
Analog-to-Digital Conversion Timing Chart


Right-channel sampling point
Right-channel conversion
Left-channel sampling point
Left-channel conversion
V_T
BCK
LRCK
MSB
DO
LSB
MSB
LSB
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Left-channel data output
Right-channel data output

CIRCUIT DESCRIPTION

Basic Analog-to-Digital Conversion

Block Diagram


OS (Offset adjustment)
R OF
Sample-and-hold circuit
R F
Integrating capacitor
C
Comparator
V_T
Lower-level
L C
L counter
(8-bit)
R N
S I
V s
Sample-and-hold switch
Integrating
amplifier
Gain amplifier
Higher-level
comparator
H C
H counter
(8-bit)
High position
S M
S L
Low position
R REF
V ref
I ref
Constant-current circuit
I M
I L
IM : IL = 128 : 1
I M = 4 IREF

Basic Operation

	S1	SM	SL	M counter	L counter	Description
1	On	Off	Off	Reset	Reset	(Sample) Holds the analog voltage applied to the Vs signal in a capacitor.
1	Off					(Hold) Turns off sample-and-hold switch S1 and holds the voltage just before the switch is turned off in a capacitor.
3		On		Count		(Conversion-1) Turns on the SM signal and discharges the capacitor with constant-current source IM. Turns off the SM signal when the capacitor voltage (VO) becomes zero. The higher-level M counter then counts the fck frequency.
4		Off	On	Hold	Count	(Conversion-2) Turns on the SL signal when the VO voltage becomes zero. Then discharges the capacitor with constant-current source IL. Turns off the SL signal when the VO voltage becomes VT. The lower-level L counter then counts the fck frequency. The L counter is carried to the M counter when a carry is produced by the L counter.
5			Off		Hold	(Conversion completion) An A/D-converted digital data when the L and M counter information is concatenated is produced after all operations above are completed.

3-3 Internal Configuration and Operation of Digital Signal Processor

Figure 14 shows the internal block diagram of a digital signal processor (NEC µPD6380). Each block operation is explained below.

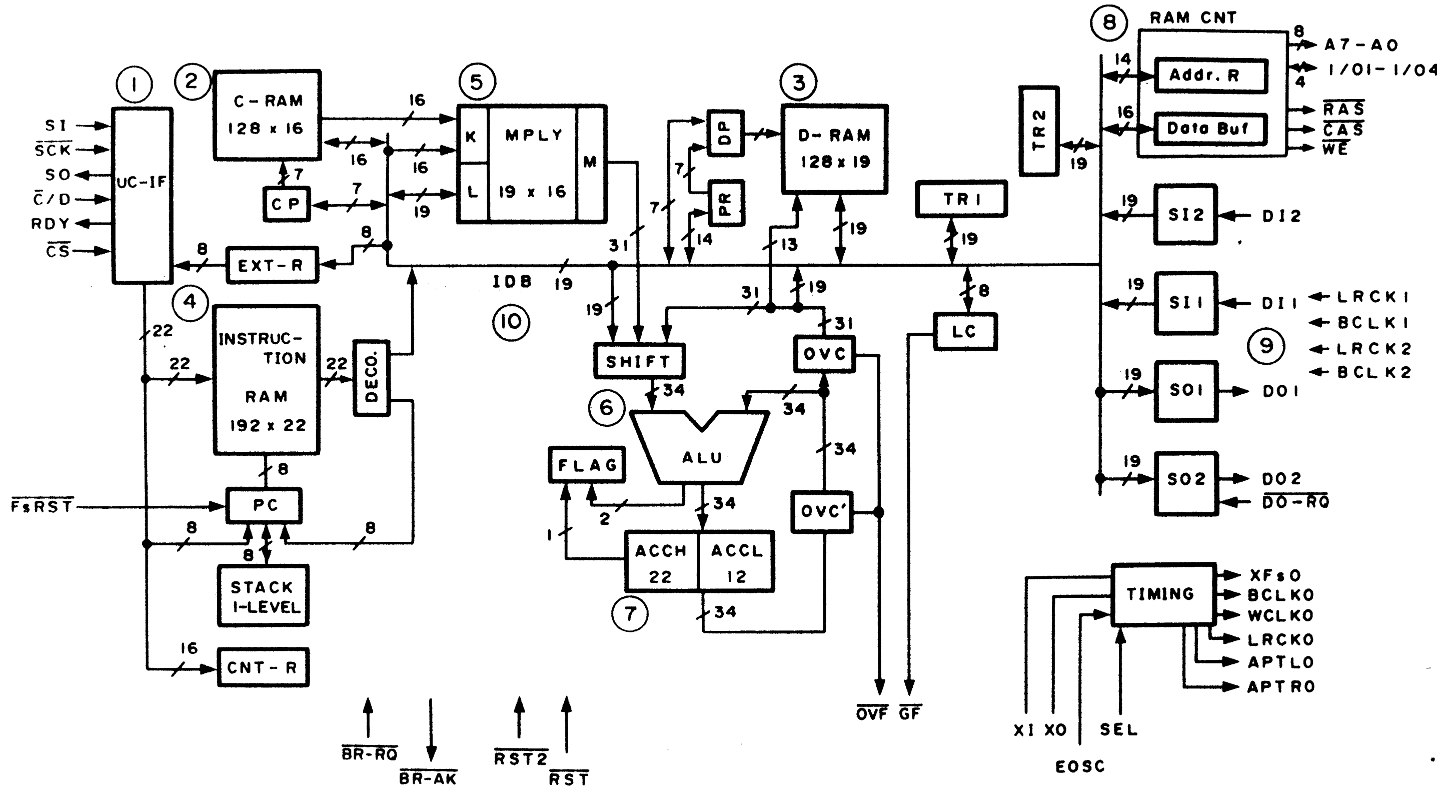

①
②
C-RAM
128 x 16
CP
EXT-R
UC-IF
SI
$\overline{SCK}$
SO
$\overline{C}$/D
RDY
$\overline{CS}$
④
INSTRUCTION RAM
192 x 22
DECO.
PC
F_sRST
STACK
I-LEVEL
CNT-R
⑤
K
L
MPLY
19 x 16
M
DP
PR
③
D-RAM
128 x 19
IDB
⑩
SHIFT
⑥
ALU
FLAG
OVC
OVC'
ACCH
22
ACCL
12
⑦
TR2
TR1
LC
⑧
RAM CNT
Addr. R
Data Buf
A7-A0
I/O1-I/O4
$\overline{RAS}$
$\overline{CAS}$
$\overline{WE}$
SI2
DI2
SI1
DI1
LRCK1
BCLK1
LRCK2
BCLK2
⑨
SO1
DO1
SO2
DO2
$\overline{DO-RO}$
TIMING
XFsO
BCLKO
WCLKO
LRCKO
APTLO
APTRO
XI
XO
SEL
EOSC
$\overline{OVF}$
$\overline{GF}$
$\overline{BR-RQ}$
$\overline{BR-AK}$
$\overline{RST2}$
$\overline{RST}$
16
7
8
22
19
31
13
14
34
2
1
4

Fig. 14 Internal Block Diagram of Digital Signal Processor

(1)	Microcomputer interface	Interfaces between a microcomputer and the digital signal processor in series.
(2)	Coefficient RAM (C-RAM)	Stores the coefficient for a filter. The address is specified by a C-RAM pointer (CP).
(3)	Data RAM (D-RAM)	The data RAM is a work area that stores data during operation. The address is specified by the D-RAM pointer (DP).
(4)	Instruction RAM	Stores a program. The address is specified using a program counter (PC).
(5)	Multiplier (MPLY)	The result data is sent to the M register in one instruction cycle when a multiplier and multiplicand are transferred to the K and L registers.
(6)	Arithmetic and logic unit (ALU)	Performs arithmetic and logic operations.
(7)	Accumulator (ACC)	The accumulator is a register that stores the result data of an ALU operation.
(8)	External RAM control	Controls the external RAM in which delay data is written.
(9)	Audio interface	Inputs or outputs an audio signal in series.
(10)	Internal data bus (IDB)	The internal data bus is an internal data transfer path between the memory and registers.

CIRCUIT DESCRIPTION

The process when the echo pattern shown in Figure 15 is reproduced by a digital signal processor is described below with the initial reflected sound as an example. See Figure 14, "Internal Block Diagram".

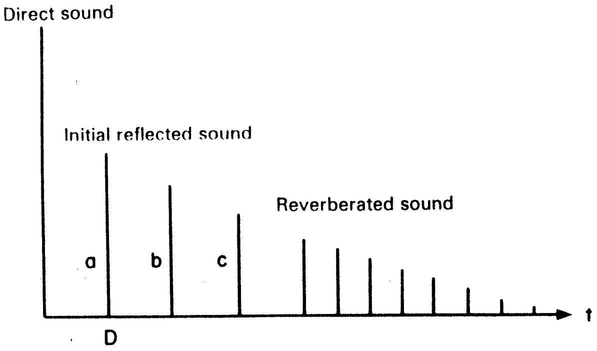


Fig. 15 Reproduced Echo Pattern

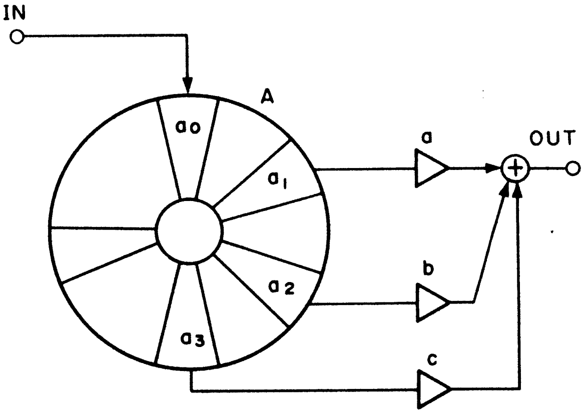


Fig. 16 Ring Buffer Model

The process when an initial reflected sound that is *a* times as high as the direct sound is reproduced after D seconds with the digital signal processor is as follows:

An audio signal is fetched from audio interface block 9 for every sampling period of T seconds and sent to external RAM control block 8. Data is then written in the external RAM constituting a ring buffer. Figure 16 shows the ring buffer example. An address is offset by A = D/T relative to the currently written a0 data and the a1 data is read to obtain the delay time corresponding to D seconds. The read data is sent to the L register of multiplier 5. To make the data size *a* times the normal, coefficient *a* is sent from coefficient RAM 2 to the K register of the multiplier. The multiplier performs a K, L operation in one instruction cycle. The result data is obtained using the M register. The signal that is delayed D seconds and made *a* times the normal size is sent from the M register to the arithmetic and logic unit (ALU) 6 and added to accumulator 7. The resultant signal is sent again from the accumulator to audio interface block 9. The signal is then output for every sampling period of T seconds. A subsequent initial reflected sound is also reproduced in the same way as above.

The digital signal processor performs the above signal processing at high speeds according to a horizontal instruction format. ALU operation, data transfer, and memory address updating are executed at the same time in one instruction cycle.

CIRCUIT DESCRIPTION

Master Microcomputer

Outline (CXP50112-154Q)

The main features of the A-94 display microcomputer are as follows:

1) 9-channel audio input and 4-channel video input
2) Digital signal processor (DSP)
3) Digital signal processor (DSP) recording

Initial Setting

Item	Setting	Item	Setting	
POWER	OFF	Surround mode	OFF	
Selector (audio)	TUNER	MEMORY	OFF	
Selector (video)	VIDEO	VISUAL. FIX	OFF	
CD DIRECT	OFF	CENTER	DOLBY	−25 dB
			DSP	−15 dB
MUTE	OFF	REAR	DOLBY	−15 dB
			DSP	−15 dB
CD REC	OFF	DEALAY TIME	DOLBY	20 mS
			DSP	35 mS
DSP REC	OFF	PRESENCE LEVEL	DSP only	−8 dB
DISPLAY	Selector mode	DSP (30 ch, 4 ch)	3 CH	ARENA
			4 CH	ARENA
SUPER WOOFER	OFF			

Memory Clear

Switch on while holding down the TUNER key.

CIRCUIT DESCRIPTION

Test mode

1. The amplifier test mode includes the two tests below.
Test 1: Fluorescent display, LED, and lamp lighting test
Test 2: Surround test
    a) Center level
    b) Rear level
    c) Presdence level
    d) Delay time

1) Selecting test mode
Switch on while holding down the CD key.

2) Use
    1) The fluorescent display and LED indicators light when the amplifier is switched on while the CD key is being hold down. Lamps then light in the order of DOLBY, DSP3CH, and DSP4CH. Test 1 mode is entered.
    2) The amplifier enters test 2 mode when the keys below are pressed in test 1 mode. (Test 1 mode is canceled.)

a) CENTER	UP KEY
b) REAR	UP KEY
c) PRESENCE	UP KEY
d) DELAY	UP KEY

The CENTER, REAR, PRESENCE, and DELAY keys are activated cyclically as described below every time they are pressed.

	Initial setting
Center level	(−15 dB)
Rear level	(−15 dB)
Presence level	(−8 dB)

The surround mode is set to DSP4CH, and the presence mode to ARENA.

The surround mode is set to DD SURROUND when the DELAY key is pressed. The delay time is changed from 15 to 30 ms every millisecond (for about 1.5 seconds).

* Keys other than CENTER, REAR, PRESENCE, and DELAY are accepted. However, the test mode may not operate normally when they are pressed.

3) Test mode canceling
Unplug the amplifier.

CAUTION:
When Test Mode is used, the memory will be cleared completely.

Timing Chart

16-Bit Communication Format

1. System

PPM two-wire bidirectional serial communication system

•Data configuration

The data configuration consists of 16 bits below.

Model code	8 bits
Function code	8 bits

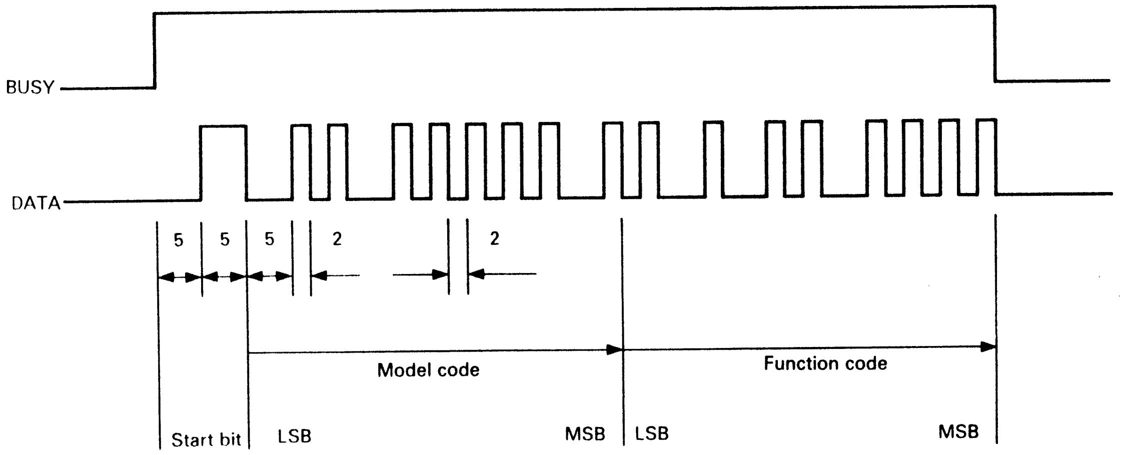
•Data format

•Start bit

Low: 5 ms, High: 5 ms

•Data

The binary value depends on the length of the space, which is delimited by 2-ms marks.
0: 2 ms, 1: 5 ms
In the example above, the model code is 85H and the function code is 16H.

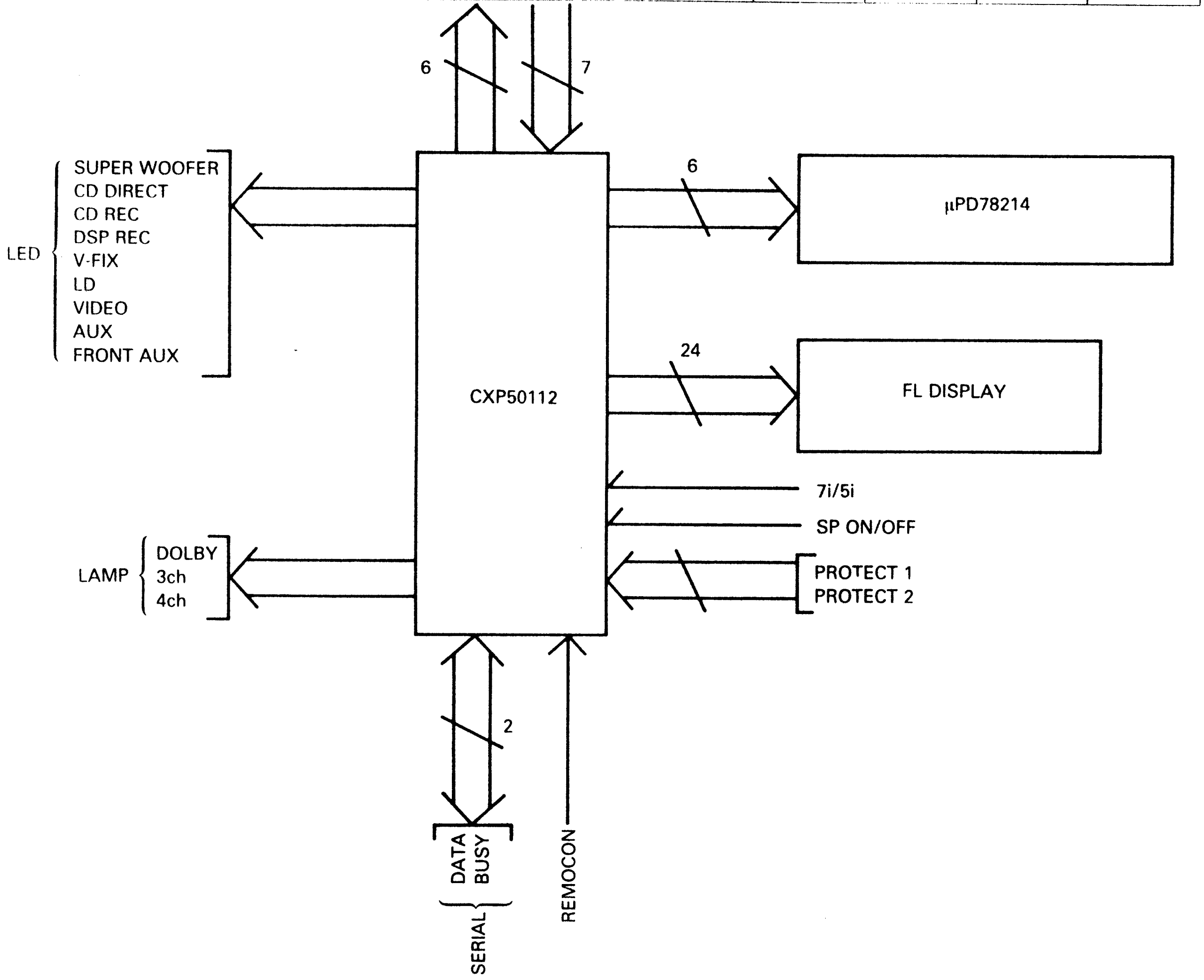


CIRCUIT DESCRIPTION

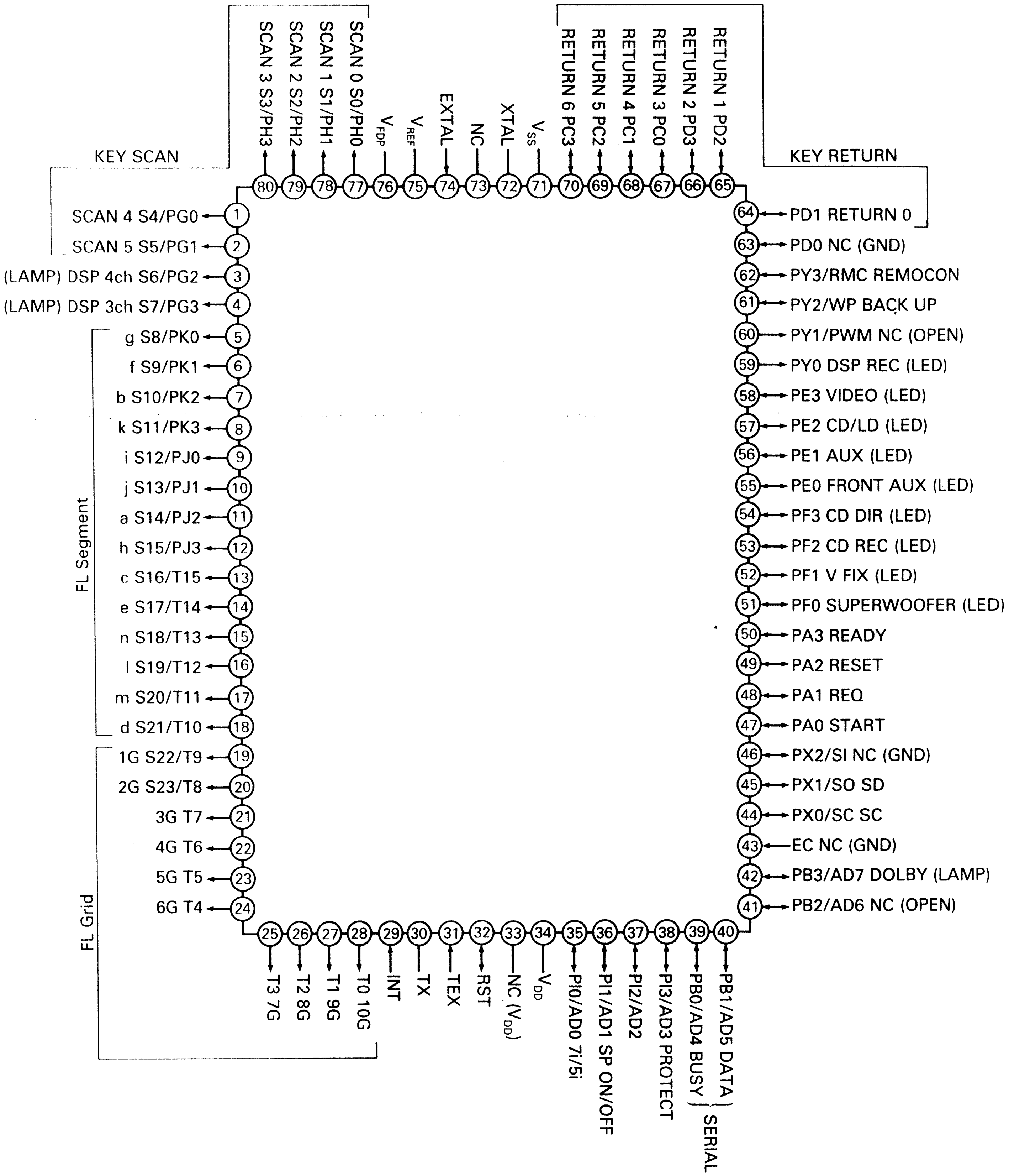
KEY SCAN

KEY RETURN

0	1	2	3	4	5	6	
CENTER	CENTER	MUTE	PRESENCE	PRESENCE	REAR	REAR	0
CD REC	CD DIRECT	DELAY	DELAY	FRONT AUX	CD	AUX	1
USER 1	USER 2	USER 3	USER 4	USER 5	USER 6	MEMORY	2
ARENA	JAZZ CLUB	STADIUM	DISCO	CHURCH	MOVIE	DISPLAY	3
POWER	V-FIX	OFF	DOLBY	DSP 3ch	DSP 4ch	DSP REC	4
SUPER WOOFER	TAPE A	TAPE B	DAT	TUNER	PHONO	VIDEO	5


6
7
LED
SUPER WOOFER
CD DIRECT
CD REC
DSP REC
V-FIX
LD
VIDEO
AUX
FRONT AUX
6
μPD78214
CXP50112
24
FL DISPLAY
7i/5i
SP ON/OFF
PROTECT 1
PROTECT 2
LAMP
DOLBY
3ch
4ch
2
DATA
BUSY
SERIAL
REMOCON

CIRCUIT DESCRIPTION


KEY SCAN
SCAN 3 S3/PH3
SCAN 2 S2/PH2
SCAN 1 S1/PH1
SCAN 0 S0/PH0
V_{FDP}
V_{REF}
EXTAL
NC
XTAL
V_{SS}
RETURN 6 PC3
RETURN 5 PC2
RETURN 4 PC1
RETURN 3 PC0
RETURN 2 PD3
RETURN 1 PD2
KEY RETURN
80
79
78
77
76
75
74
73
72
71
70
69
68
67
66
65
SCAN 4 S4/PG0
1
SCAN 5 S5/PG1
2
(LAMP) DSP 4ch S6/PG2
3
(LAMP) DSP 3ch S7/PG3
4
g S8/PK0
5
f S9/PK1
6
b S10/PK2
7
k S11/PK3
8
i S12/PJ0
9
j S13/PJ1
10
a S14/PJ2
11
h S15/PJ3
12
c S16/T15
13
e S17/T14
14
n S18/T13
15
l S19/T12
16
m S20/T11
17
d S21/T10
18
FL Segment
1G S22/T9
19
2G S23/T8
20
3G T7
21
4G T6
22
5G T5
23
6G T4
24
FL Grid
64
PD1 RETURN 0
63
PD0 NC (GND)
62
PY3/RMC REMOCON
61
PY2/WP BACK UP
60
PY1/PWM NC (OPEN)
59
PY0 DSP REC (LED)
58
PE3 VIDEO (LED)
57
PE2 CD/LD (LED)
56
PE1 AUX (LED)
55
PE0 FRONT AUX (LED)
54
PF3 CD DIR (LED)
53
PF2 CD REC (LED)
52
PF1 V FIX (LED)
51
PF0 SUPERWOOFER (LED)
50
PA3 READY
49
PA2 RESET
48
PA1 REQ
47
PA0 START
46
PX2/SI NC (GND)
45
PX1/SO SD
44
PX0/SC SC
43
EC NC (GND)
42
PB3/AD7 DOLBY (LAMP)
41
PB2/AD6 NC (OPEN)
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
T3 7G
T2 8G
T1 9G
T0 10G
INT
TX
TEX
RST
NC (V_{DD})
V_{DD}
PI0/AD0 7i/5i
PI1/AD1 SP ON/OFF
PI2/AD2
PI3/AD3 PROTECT
PB0/AD4 BUSY
PB1/AD5 DATA
SERIAL

CIRCUIT DESCRIPTION

Pin Functions

Pin No.	Pin name	I/O	Name	Description
1	S4/DG0	O	SCAN4	Key scan 4
2	S5/DG1	O	SCAN5	Key scan 5
3	S6/DG2	O	DSP4CH	LAMP
4	S7/DG3	O	DSP3CH	LAMP
5	S8/DK0	O	SEGMENT 1	FL segment g
6	S9/DK1	O	SEGMENT 2	FL segment f
7	S10/DK2	O	SEGMENT 3	FL segment b
8	S11/DK3	O	SEGMENT 4	FL segment k
9	S12/PJ0	O	SEGMENT 5	FL segment i
10	S13/PJ1	O	SEGMENT 6	FL segment j
11	S14/PJ2	O	SEGMENT 7	FL segment a
12	S15/PJ3	O	SEGMENT 8	FL segment h
13	S16/T15	O	SEGMENT 9	FL segment c
14	S17/T14	O	SEGMENT 10	FL segment e
15	S18/T13	O	SEGMENT 11	FL segment n
16	S19/T12	O	SEGMENT 12	FL segment l
17	S20/T11	O	SEGMENT 13	FL segment m
18	S21/T10	O	SEGMENT 14	FL segment d
19	S22/T9	O	GRID 1	Fluorescent display grid 1
20	S23/T8	O	GRID 2	Fluorescent display grid 2
21	T7	O	GRID 3	Fluorescent display grid 3
22	T6	O	GRID 4	Fluorescent display grid 4
23	T5	O	GRID 5	Fluorescent display grid 5
24	T4	O	GRID 6	Fluorescent display grid 6
25	T3	O	GRID 7	Fluorescent display grid 7
26	T2	O	GRID 8	Fluorescent display grid 8
27	T1	O	GRID 9	Fluorescent display grid 9
28	T0	O	GRID 10	Fluorescent display grid 10
29	IMT	I	INT	Interrupt (unused)
30	TX	—	TX	32-kHz oscillator (unused)
31	TEX	I	TEX	32-kHz oscillator
32	RST	I/O	RST	Microcomputer reset
33	NC	—		
34	V_{DD}	—	V_{DD}	Power supply
35	PI0/AD0	I	7I/5I	Model discrimination
36	PI1/AD1	I	SP ON/OFF	Speaker on/off input
37	PI2/AD2	—	NC use	
38	PI3/AD3	I	PROTECT	Protection input
39	PB0/AD4	I/O	DATA	Serial data line
40	PB1/AD5	I/O	BUSY	Serial busy
41	PB2/AD6	—	NC	NC (OPEN)
42	PB3/AD7	O	DOLBY	LAMP
43	EC	—	NC	NC (GND)
44	PX0/SC	O	SC	S = O clock (for communication)

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Name	Description
45	PX1/S0	O	SD	S – O data (for communication)
46	PV2/S1	—	NC	NC (GND)
47	PA0	O	START	Start (for communication)
48	PA1	O	REQ	Request (for communication)
49	PA2	O	RESET	Reset (for communication)
50	PA3	I	READY	Ready (for communication)
51	PF0	O	SVPERWOOFER	LED
52	PF1	O	V · FIX	LED
53	PF2	O	CD · REC	LED
54	PF3	O	CD DIR	LED
55	PE0	O	F · RONT AUX	LED Used for video display
56	PE1	O	AUX	LED
57	PE2	O	CD/LD	LED
58	PE3	O	V2DEO	LED
59	PY0	O	DSP REC	LED
60	PY1/DWM	O	NC	NC (OPEN)
61	PY2/WP	I	BACK UP	Backup input
62	PY3/RMC	I	REMOCON	Remote control input
63	PD0	—	NC	NC (GND)
64	PD1	I	RETORN 0	Auto-return 0
65	PD2	I	RETORN 1	Auto-return 1
66	PD3	I	RETORN 2	Auto-return 2
67	PC0	I	RETORN 3	Auto-return 3
68	PC1	I	RETORN 4	Auto-return 4
69	PC2	I	RETORN 5	Auto-return 5
70	PC3	I	RETORN 6	Auto-return 6
71	V_{SS}	—		GND
72	XTAL	—		Crystal
73	NC	—		
74	EXTAL	I		Oscillation pin
75	V_{REF}	—		Reference voltage for voltage detection (unused)
76	V_{FDP}	—		Fluorescent display power supply
77	PH0	O	SCAN 0	Key scan 0
78	PH1	O	SCAN 1	Key scan 1
79	PH2	O	SCAN 2	Key scan 2
80	PH3	O	SCAN 3	Key scan 3

CIRCUIT DESCRIPTION

Slave Microcomputer (μPD78214CW-668)

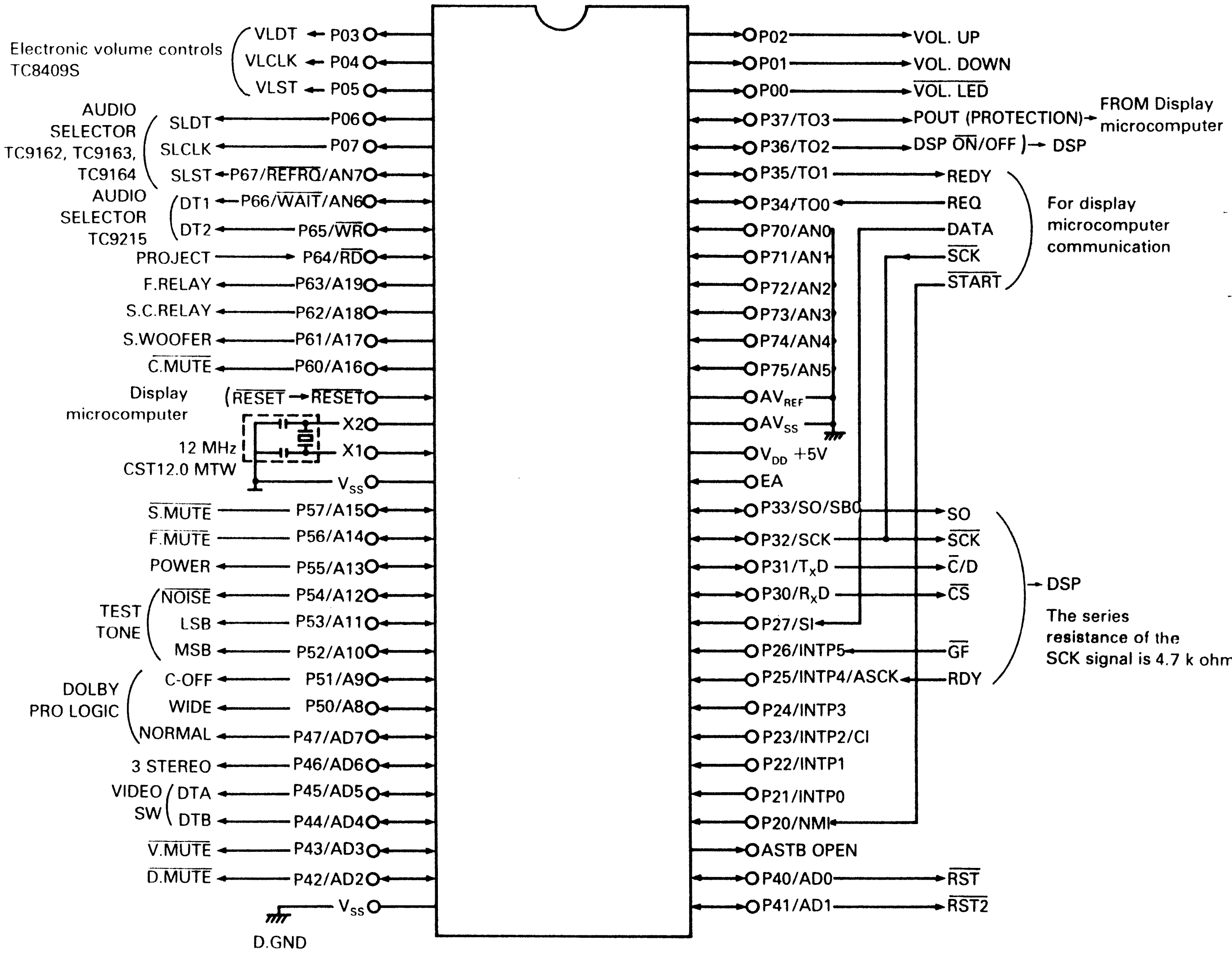
Outline

The slave microcomputer is used for DSP amplifiers. This microcomputer provides the following amplifier control functions through data communications with the display microcomputer (CXP50112-154Q):

- Selector selection (muting control) TC9162N, etc.
- Electronic volume control TC9213P
- Speaker relay control
- Surround control (DSP IC μPD6380)
  - Dolby surround, Dolby Prologic, and DSP
  - Rear and Center levels (TC9213P)
  - Delay time (DSP IC μPD6380)
  - Presence level (DSP IC μPD6380)
- Video selection

2.3 Pin Connection (Top View)

64-pin plastic shrink DIP and 64-pin plastic QUIP


Electronic volume controls
TC8409S
VLDT P03
VLCLK P04
VLST P05
AUDIO SELECTOR TC9162, TC9163, TC9164
SLDT P06
SLCLK P07
SLST P67/REFRQ/AN7
AUDIO SELECTOR TC9215
DT1 P66/WAIT/AN6
DT2 P65/WR
PROJECT P64/RD
F.RELAY P63/A19
S.C.RELAY P62/A18
S.WOOFER P61/A17
C.MUTE P60/A16
Display microcomputer
RESET RESET
X2
12 MHz
CST12.0 MTW
X1
VSS
S.MUTE P57/A15
F.MUTE P56/A14
POWER P55/A13
TEST TONE
NOISE P54/A12
LSB P53/A11
MSB P52/A10
DOLBY PRO LOGIC
C-OFF P51/A9
WIDE P50/A8
NORMAL P47/AD7
3 STEREO P46/AD6
VIDEO SW
DTA P45/AD5
DTB P44/AD4
V.MUTE P43/AD3
D.MUTE P42/AD2
VSS
D.GND
P02 VOL. UP
P01 VOL. DOWN
P00 VOL. LED
P37/TO3 POUT (PROTECTION)
P36/TO2 DSP ON/OFF
FROM Display microcomputer
DSP
P35/TO1 REDY
P34/TO0 REQ
P70/AN0 DATA
P71/AN1 SCK
P72/AN2 START
For display microcomputer communication
P73/AN3
P74/AN4
P75/AN5
AVREF
AVSS
VDD +5V
EA
P33/SO/SB0 SO
P32/SCK SCK
P31/TXD C/D
P30/RXD CS
P27/SI
P26/INTP5 GF
P25/INTP4/ASCK RDY
DSP
The series resistance of the SCK signal is 4.7 k ohm
P24/INTP3
P23/INTP2/CI
P22/INTP1
P21/INTP0
P20/NMI
ASTB OPEN
P40/AD0 RST
P41/AD1 RST2

Note: Pin compatible with μPD78210CW/GQ.

CIRCUIT DESCRIPTION

2.4 Pin Functions

Pin No.	Pin name	I/O	Name	Description	
1	P03	O	VLDT	Electronic volume control IC (TC9213P) data output	REAR =
2	P04	O	VLCLK	Electronic volume control IC (TC9213P) clock output	LEFT CENTER =
3	P05	O	VLST	Electronic volume control IC (TC9213P) strobe output	RIGET
4	P06	O	SLDT	Switch array IC (TC9162N, TC9163N, and TC9164N) data output	
5	P07	O	SLCLK	Switch array IC (TC9162N, TC9163N, and TC9164N) clock output	
6	P67	O	SLST	Switch array IC (TC9162N, TC9163N, and TC9164N) strobe output	
7	P66	O	DT1	TC9215 DT1 signal output	
8	P65	O	DT2	TC9215 DT2 signal output	

	PROLOGIC		DOL SUR	
MODE	DT1	DT2	DT1	DT2
OFF	0	1	0	1
DOLBY	0	0	0	1
DSP	1	0	1	0

Pin No.	Pin name	I/O	Name	Description	
9	P64	I	PROTECT	Protection signal input	Low: Normal High: Protected
10	P63	O	F.RELAY	Front speaker relay control	Low: Speaker off High: Speaker on
11	P62	O	S.C.RELAY	Rear center speaker relay control	Low: Speaker off High: Speaker on
12	P61	O	S.WOOFER	Super-woofer output control	Low: No output High: Output
13	P60	O	CMUTE	Center output mute	Low: Mute on High: Mute off
14	RESET	I		Reset	High: Normal Low: Reset
15	X2			System clock oscillator connection (12 MHz)	
16	X1	I		System clock oscillator connection (12 MHz)	
17	V_{SS}			Ground	
18	P57	O	S.MUTE	Rear output mute	Low: Mute on High: Mute off
19	P56	O	F.MUTE	Front output mute	Low: Mute on High: Mute off
20	P55	O	POWER	Power supply control pin	Low: Power off High: Power on
21	P54	O	NOISE	Dolby Prologic test tone output control	Low: Test tone off High: Test tone on
22	P53	O	LSB	Test tone output position specification	
23	P52	O	MSB		

	L	C	R	S
LSB	0	1	0	1
MSB	0	0	1	1

Pin No.	Pin name	I/O	Name	Description
24	P51	O	C-OFF	Dolby Prologic center mode setting (center off)
25	P50	O	WIDE	
26	P47	O	NORMAL	
27	P46	O	3 STEREO	

	NORMAL	WIDE	PHANTOM
WIDE	0	1	0
NORMAL	1	0	0

Pin No.	Pin name	I/O	Name	Description
28	P45	O	DTA	Video selection control
29	P44	O	DTB	

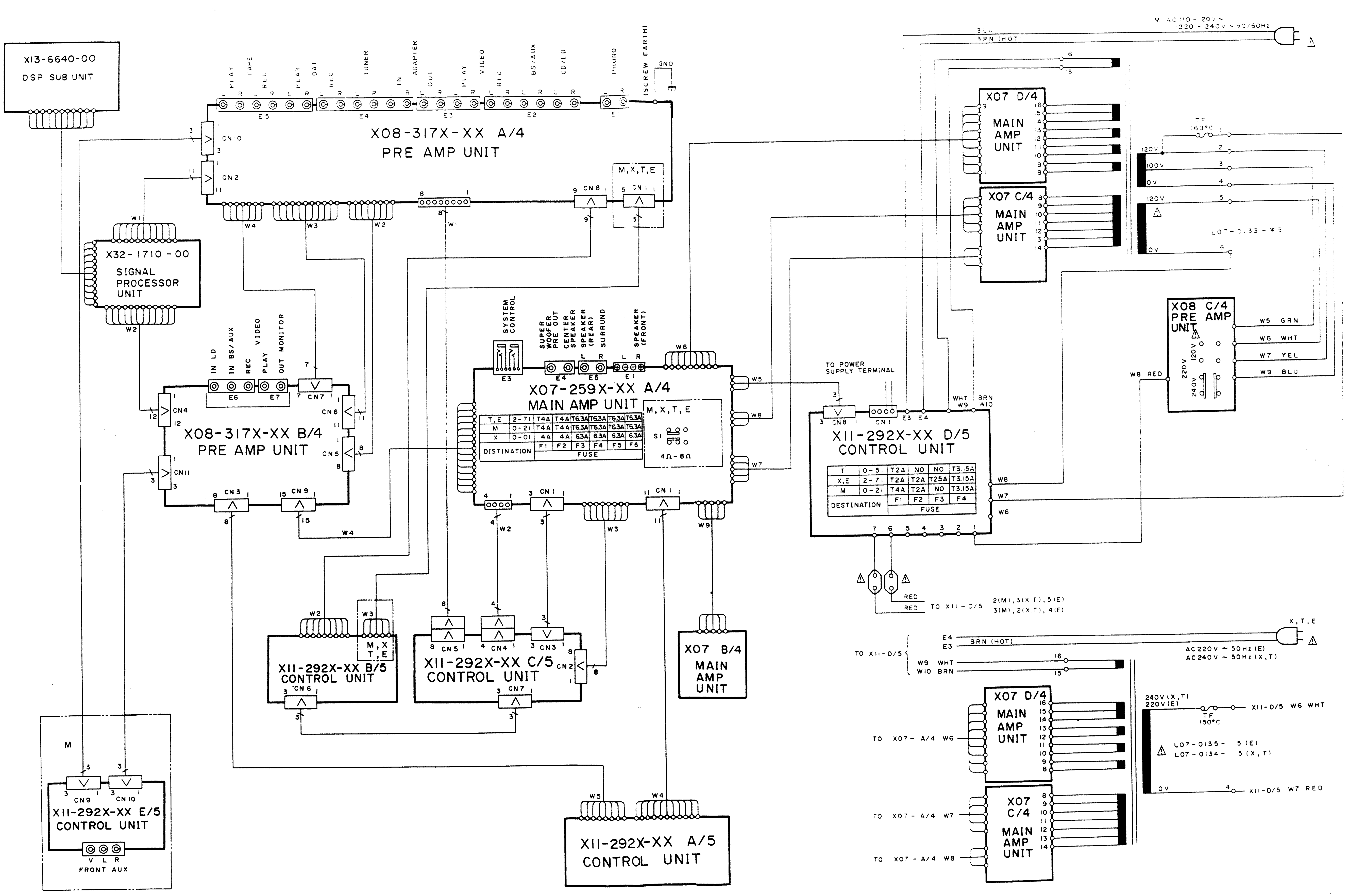
	VIDEO	AUX1	CD/LD	AUX2
DTA T	1	1	0	0
DTB	1	0	1	0

Pin No.	Pin name	I/O	Name	Description
30	P43	O	V.MUTE	Video output muting

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Name	Description	
31	P42	O	D.MUTE	DSP board output muting	
32	V_{SS}			Ground	
33	P41	O	RST2	DSP IC (μPD6380) RST2 signal output	
34	P40	O	RST	DSP IC (μPD6380) RST signal output	
35	ASTB	O		Unused (opened, pulled up, and pulled down)	
36	P20/NMI	I		START signal input for communications with display microcomputer	
37	P21	I		Unused (pulled up and pulled down)	
~	~			Unused (pulled up and pulled down)	
40	P24	I		Unused (pulled up and pulled down)	
41	P25	I	RDY	DSP IC (μPD6380) RDY signal input	
42	P26	I	GF	DSP IC (μPD6380) GF signal input	
43	P27/SI	I	DATA	Data signal input for communications with display microcomputer	
44	P30	O	CS	DSP IC (μPD6380) CS signal output	
45	P31	O	C/D	DSP IC (μPD6380) C/D signal output	
46	P32	I/O	SCK	SCK signal input during communications with display microcomputer SCK signal output during DSP IC (μPD6380) data output	
47	P33/SO	O	SO	DSP IC (μPD6380) SO (data) signal output	
48	EA	I		Unused (ROMless operation instruction) Pulled up or pulled down.	
49	V_{DD}			Microcomputer power supply	
50	AV_{SS}			Unused (ground for analog-to-digital converter)	Ground
51	AV_{REF}			Unused (Reference voltage for analog-to-digital converter is applied)	Ground
52 ~ 57	P75/AN5 ~ P70/AN0	I ~ I		Unused Ground ~ Unused Ground	GND ~ GND
58	P34/TO0	I	REQ	REQ signal input for communications with display microcomputer	
59	P35/TO1	I	REDY	REDY signal output for communications with display microcomputer	
60	P36/TO2	O	DSP ON/OFF	DSP oscillator stop control on DSP board	High: Stop Low: Oscillate
61	P37/TO3	O	POUT	Protection status report signal to display microcomputer	High: Protected Low: Normal
62	P00	O	VOL.LED	Electronic volume control LED drive	Low: Lights High: Goes off
63	P01	O	VOL.DOWN	Electronic volume control down signal output	
64	P02	O	VOL.UP	Electronic volume control up signal output	

WIRING DIAGRAM


X13-6640-00
DSP SUB UNIT
X32-1710-00
SIGNAL PROCESSOR UNIT
W1
W2
X08-317X-XX A/4
PRE AMP UNIT
PLAY
TAPE
REC
PLAY
DAT
REC
TUNER
IN
ADAPTER
OUT
PLAY
VIDEO
REC
BS/AUX
CD/LD
PHONO
(SCREW EARTH)
GND
L
R
E5
E4
E3
E2
E1
CN10
CN2
CN8
CN1
M,X,T,E
W4
W3
W2
W1
IN LD
IN BS/AUX
REC
VIDEO
PLAY
OUT MONITOR
E6
E7
CN7
CN4
CN6
CN5
CN11
CN3
CN9
X08-317X-XX B/4
PRE AMP UNIT
W4
SYSTEM CONTROL
SUPER WOOFER PRE OUT
CENTER SPEAKER
SPEAKER (REAR)
SURRUND
SPEAKER (FRONT)
E3
E4
E5
E1
W6
W5
W8
W7
X07-259X-XX A/4
MAIN AMP UNIT
M,X,T,E
S1
4Ω-8Ω
CN1
W2
W3
W9
X11-292X-XX B/5
CONTROL UNIT
M,X
T,E
CN6
X11-292X-XX C/5
CONTROL UNIT
CN5
CN4
CN3
CN2
CN7
X07 B/4
MAIN AMP UNIT
M
X11-292X-XX E/5
CONTROL UNIT
CN9
CN10
V L R
FRONT AUX
W5
W4
X11-292X-XX A/5
CONTROL UNIT
BLU
BRN (HOT)
M AC 110-120V ~
/220-240V ~ 50/60Hz
X07 D/4
MAIN AMP UNIT
X07 C/4
MAIN AMP UNIT
TF
169°C
120V
100V
0V
120V
0V
L07-0133-*5
X08 C/4
PRE AMP UNIT
120V
220V
240V
W5 GRN
W6 WHT
W7 YEL
W9 BLU
W8 RED
TO POWER SUPPLY TERMINAL
CN8
CN1
E3 E4
WHT W9
BRN W10
X11-292X-XX D/5
CONTROL UNIT
W8
W7
W6
RED
RED
TO X11-D/5
2(M), 3(X.T), 5(E)
3(M), 2(X.T), 4(E)
X,T,E
AC220V ~ 50Hz (E)
AC240V ~ 50Hz (X,T)
TO X11-D/5
E4
E3
BRN (HOT)
W9 WHT
W10 BRN
X07 D/4
MAIN AMP UNIT
TO X07-A/4 W6
X07 C/4
MAIN AMP UNIT
TO X07-A/4 W7
TO X07-A/4 W8
240V (X,T)
220V (E)
TF
150°C
X11-D/5 W6 WHT
L07-0135- 5 (E)
L07-0134- 5 (X,T)
0V
X11-D/5 W7 RED

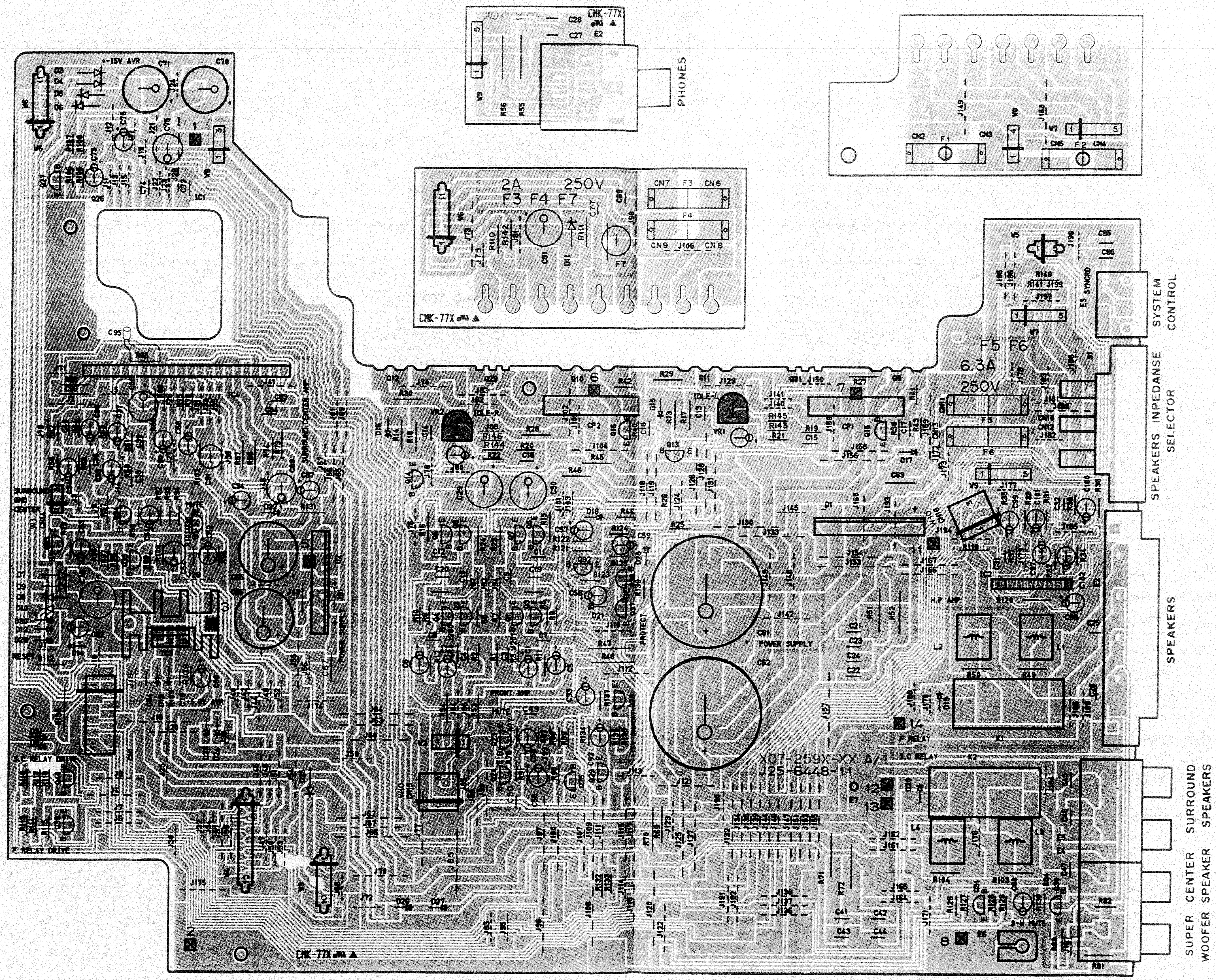
X07-259X-XX A/4 MAIN AMP UNIT

T,E	2-71	T4A	T4A	T6.3A	T6.3A	T6.3A	T6.3A
M	0-21	T4A	T4A	T6.3A	T6.3A	T6.3A	T6.3A
X	0-01	4A	4A	6.3A	6.3A	6.3A	6.3A
DISTINATION		F1	F2	F3	F4	F5	F6
		FUSE					

X11-292X-XX D/5 CONTROL UNIT

T	0-51	T2A	NO	NO	T3.15A
X,E	2-71	T2A	T2A	T25A	T3.15A
M	0-21	T4A	T2A	NO	T3.15A
DESTINATION		F1	F2	F3	F4
		FUSE			

PC BOARD (Component side view) MAIN AMPLIFIER UNIT


CMK-77X
C28
C27
E2
PHONES
R56
R55
2A 250V
F3 F4 F7
CN7 F3 CN6
F4
CN9 J106 CN8
F7
CN2 F1 CN3
CN5 F2 CN4
V7
SYSTEM CONTROL
F5 F6
6.3A
250V
SPEAKERS INPEDANSE SELECTOR
SPEAKERS
SURROUND SPEAKERS
SUPER WOOFER
CENTER SPEAKER
+-15V AVR
IC1
IC2
IDLE-R
IDLE-L
VR1
VR2
H.P AMP
POWER SUPPLY
PROTECT
FRONT AMP
MUTE
SURROUND CENTER AMP
F RELAY
S.C RELAY
F RELAY DRIVE
S.C RELAY DRIVE
RESET
K1
K2
L2
L4
X07-259X-XX A/4
J25-6448-11

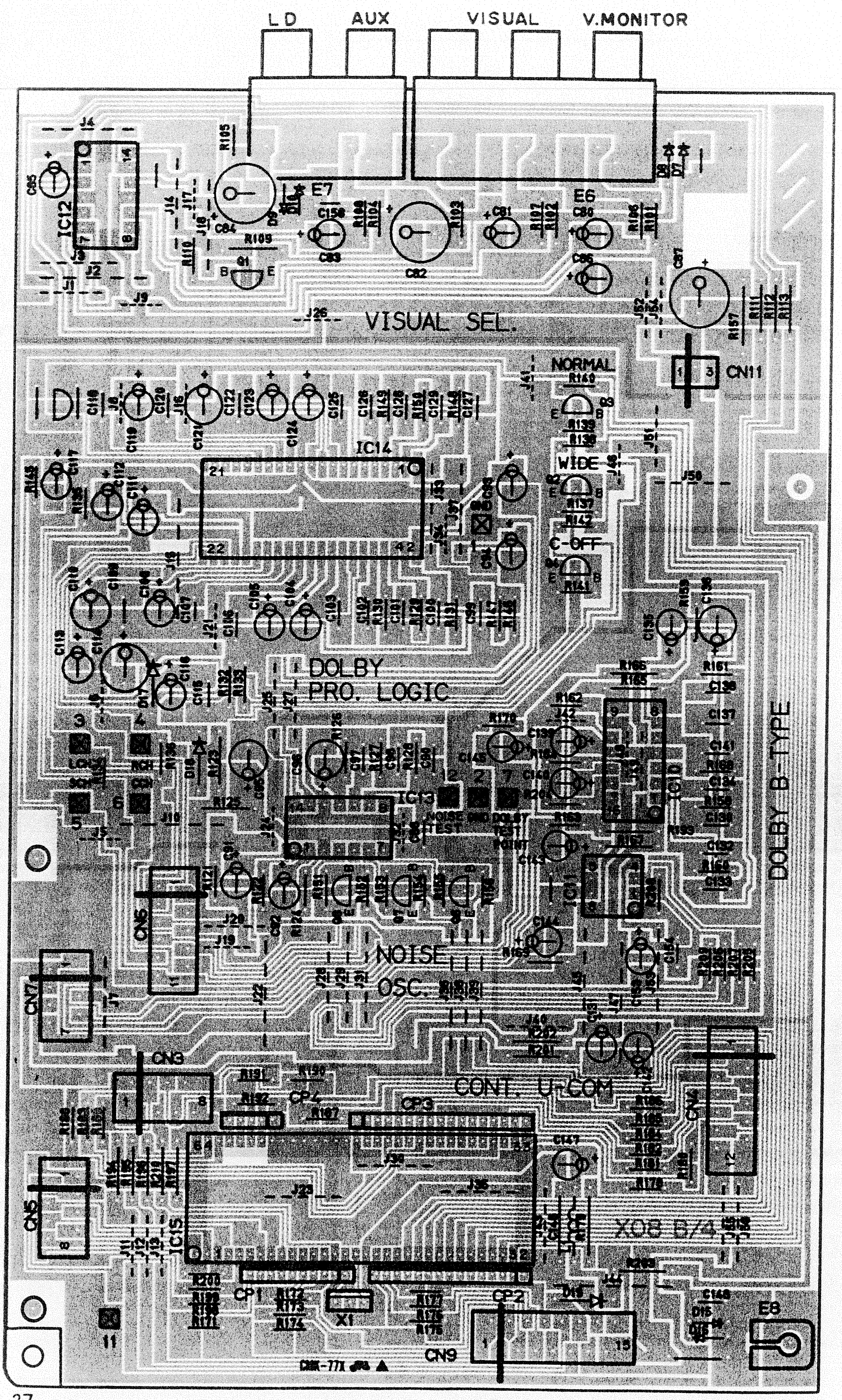
X07-2592-XX		
Ref. No. IC	Q	Address
	1	5E
	2	5D
	3	5E
	4	5D
	5	4E
	6	4D
	7	4E
	8	4D
	9	4G
	10	4E
	11	4F
	12	4D
	13	4F
	14	4D
	15	4G
	16	4E
	21	4F
	22	4E
	23	6E
	24	6E
	25	6E
	26	2B
	27	2B
	28	5E
	29	6E
	30	6H
	31	6H
	32	4E
	33	4B
	34	4B
	35	4B
	36	4C
	37	5E
	38	5E
	39	6B
	40	6B
1		2C
2		5H
3		5C

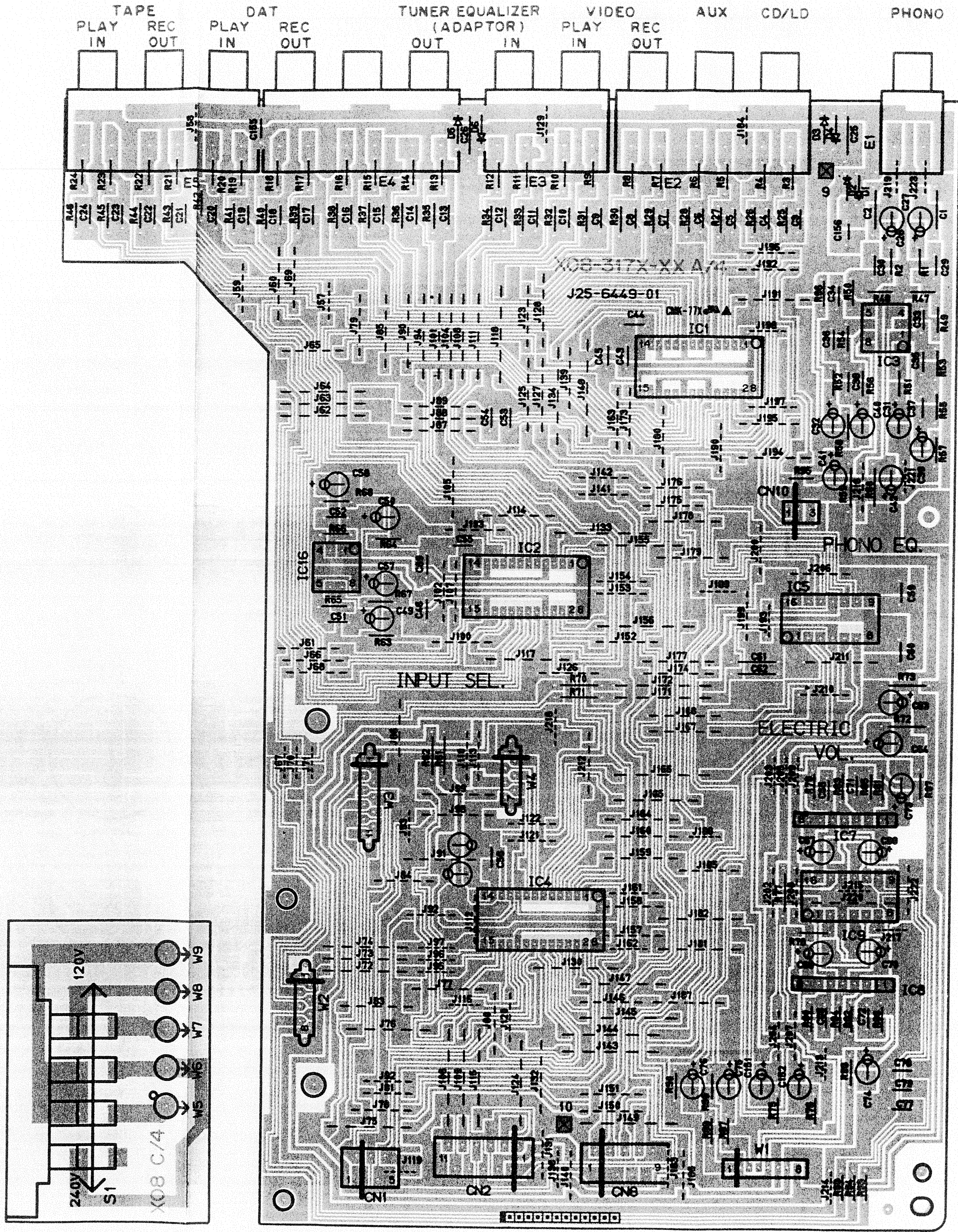
Refer to the schematic diagram for the values of resistors and capacitors

K L M N O P Q R S T

PC BOARD (Component side view)

PREAMPLIFIER UNIT


LD
AUX
VISUAL
V.MONITOR
VISUAL SEL.
NORMAL
WIDE
C-OFF
IC14
IC12
DOLBY
PRO. LOGIC
DOLBY B-TYPE
NOISE
OSC.
CONT. U-COM
IC15
CN3
CN5
CN6
CN7
CN9
CN11
CP1
CP2
CP3
CP4
X1
E6
E7
E8
X08 B/4

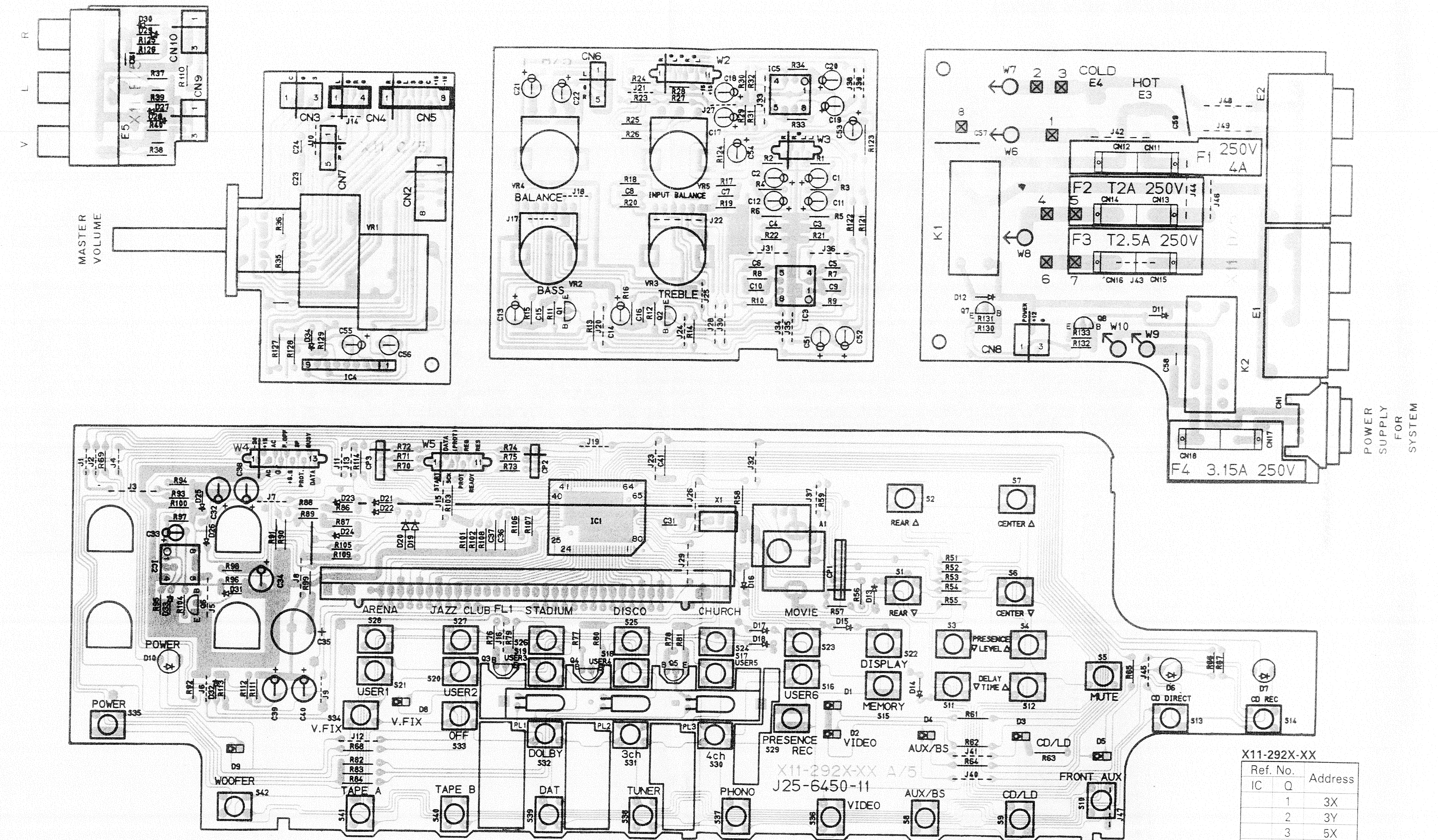

TAPE
PLAY IN
REC OUT
DAT
PLAY IN
REC OUT
TUNER EQUALIZER (ADAPTOR)
OUT
IN
VIDEO
PLAY IN
REC OUT
AUX
CD/LD
PHONO
X08-317X-XX A/4
J25-6449-01
IC1
IC2
IC3
IC4
IC5
IC7
IC8
IC9
IC16
INPUT SEL.
PHONO EQ.
ELECTRIC VOL.
CN1
CN2
CN8
CN10
W1
W2
W3
W4
E1
E2
E3
E4
E5
120V
240V
S1
W5
W6
W7
W8
W9
X08 C/4

X08-317X-XX

Ref. No.		Address
IC	Q	
	1	2L
1		3R
2		4Q
3		3S
4		5Q
5		4S
7		5S
8		6S
9		6S
10		4M
11		5M
12		2K
15		6L
16		4P

Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD (Component side view) CONTROL UNIT


R
L
V
E5
CN10
CN9
MASTER VOLUME
CN3
CN4
CN5
CN7
CN2
VR1
IC4
CN6
W2
IC5
W3
VR4
BALANCE
VR5
INPUT BALANCE
BASS
VR2
VR3
TREBLE
W7
2
3
COLD
E4
HOT
E3
E2
8
W6
1
F1 250V 4A
F2 T2A 250V
F3 T2.5A 250V
4
5
6
7
K1
W8
W10
W9
CN8
E1
K2
CN1
CN17
CN18
F4 3.15A 250V
POWER SUPPLY FOR SYSTEM
W4
W5
IC1
X1
A1
FL1
REAR △
CENTER △
REAR ▽
CENTER ▽
POWER
ARENA
JAZZ CLUB
STADIUM
DISCO
CHURCH
MOVIE
USER1
USER2
USER3
USER4
USER5
USER6
DISPLAY
PRESENCE ▽ LEVEL △
DELAY ▽ TIME △
MEMORY
MUTE
CD DIRECT
CD REC
V.FIX
OFF
DOLBY
3ch
4ch
PRESENCE REC
VIDEO
AUX/BS
CD/LD
FRONT AUX
WOOFER
TAPE A
TAPE B
DAT
TUNER
PHONO
X11-292X-XX A/5
J25-6450-11

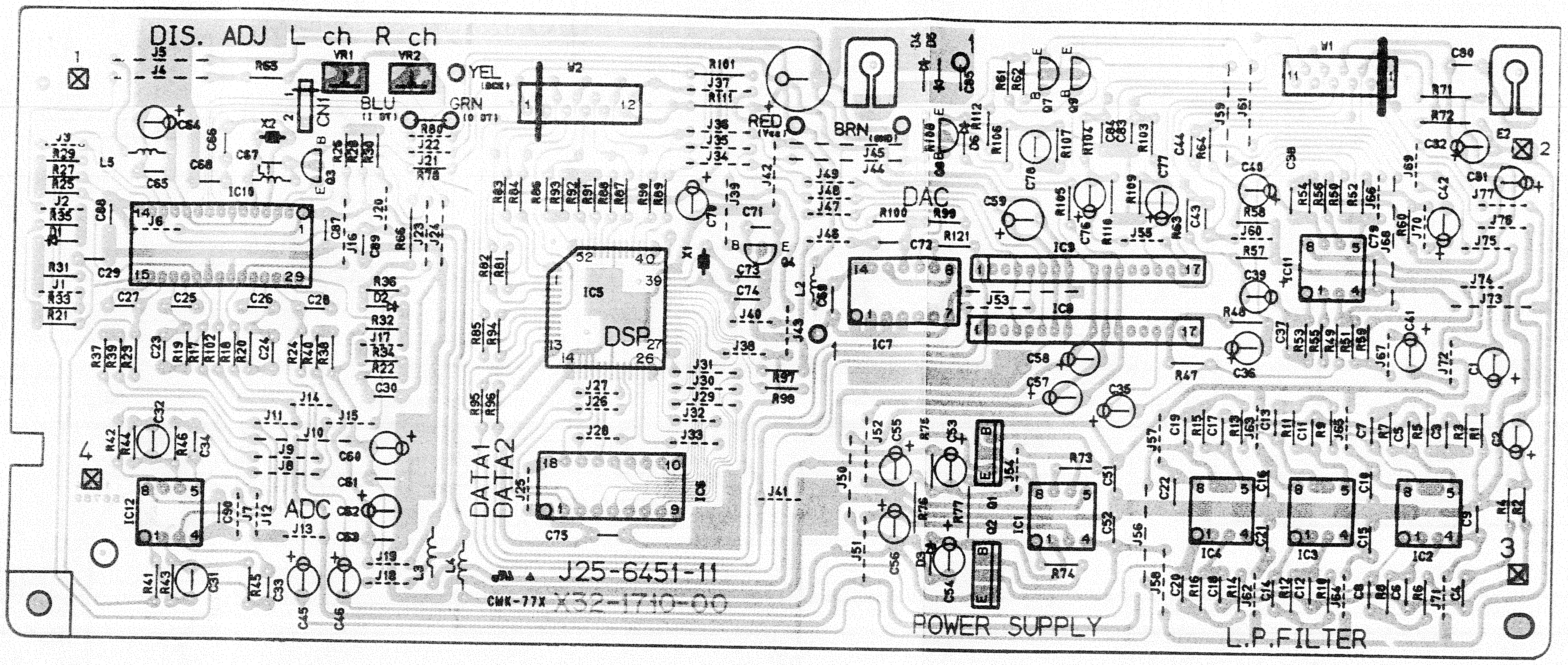
Refer to the schematic diagram for the values of resistors and capacitors.

X11-292X-XX

Ref. No.		Address
IC	Q	
	1	3X
	2	3Y
	3	5X
	4	5Y
	5	5Y
	6	5V
	7	3AA
	8	3AB
1		4Y
2		5V
3		3Z
4		3W
5		1Z

PC BOARD (Component side view)

SIGNAL PROCESSOR UNIT


DIS. ADJ L ch R ch
VR1
VR2
YEL
BLU
GRN
RED
BRN
CN1
IC10
IC5
DSP
X1
DAC
IC7
IC8
IC9
IC12
ADC
IC6
DATA1
DATA2
J25-6451-11
CMK-77X X32-1710-00
IC1
IC4
IC3
IC2
POWER SUPPLY
L.P.FILTER
W1
W2
1
2
3
4

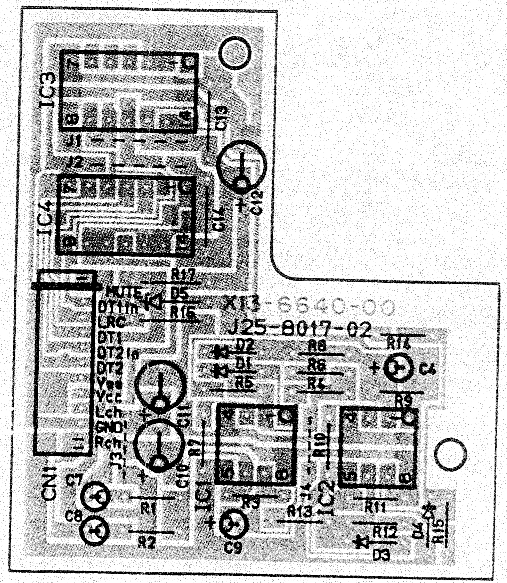
X13-6640-XX

Ref. No.		Address
IC	Q	
1		6AG
2		6AG
3		5AF
4		5AF

X32-1710-00

Ref. No.		Address
IC	Q	
	1	3AI
	2	3AI
	3	2AG
	4	2AI
	7	1AJ
	8	2AI
	9	1AJ
1		3AJ
2		2AK
3		2AK
4		3AJ
5		2AH
6		3AH
7		2AI
8		2AJ
9		2AJ
10		2AF
11		2AK
12		3AF

DSP SUB UNIT

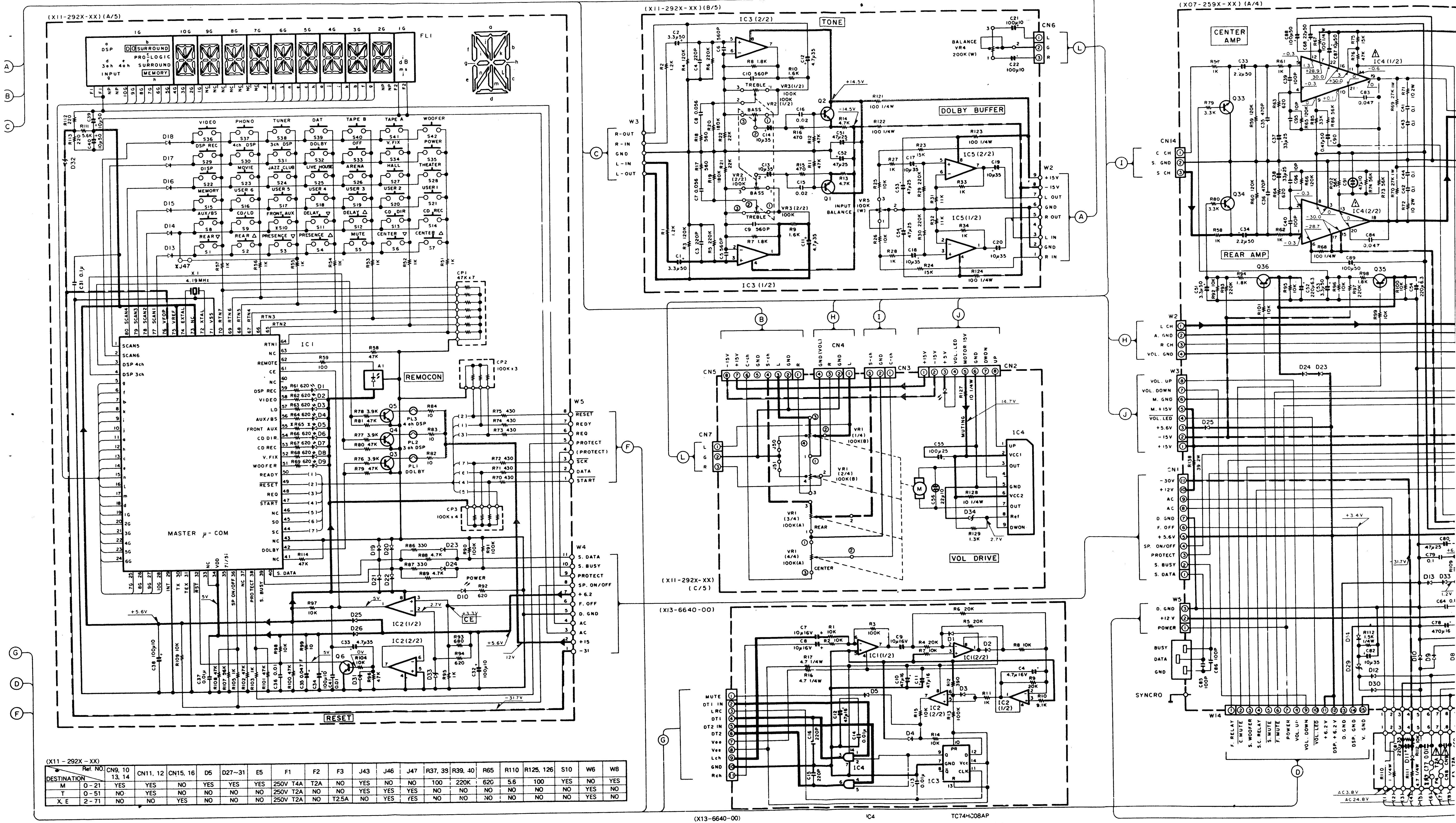

IC3
IC4
IC1
IC2
CN1
X13-6640-00
J25-8017-02
MUTE
Vcc
Lch
GND
Rch

Refer to the schematic diagram for the values of resistors and capacitors.

(X11-292X-XX)
IC1 : CXP50112-154Q
IC2 : AN6914 or BA10393
IC3, 5 : NJM4580D-D or μPC4570C-A
IC4 : TA8409S

Q1~6 : 2SC1740S(Q, R) or 2SC945(A)(Q, P)
Q7, 8 : 2SC2003(L, K)
D1~5, 8, 9 : B30-1289-05
D6, 7, 10 : B30-1291-05
D11, 12 : 1SS131 or HSS104A

D13~31 : 1SS133 or HSS104
D32 : HZS5.1N(B2) or RD5.1ES(B2)
D33, 34 : HZS2.7N(B2) or RD2.7ES(B2)


(X11-292X-XX)(A/5)
FL1
MASTER μ-COM
IC1
REMOCON
RESET
IC2(1/2)
IC2(2/2)
W4
W5
(X11-292X-XX)(B/5)
TONE
DOLBY BUFFER
IC3(2/2)
IC3(1/2)
IC5(2/2)
IC5(1/2)
BASS
TREBLE
INPUT BALANCE
BALANCE VR4 200K(W)
CN6
W2
W3
(X11-292X-XX)(C/5)
VOL DRIVE
IC4
CN2
CN3
CN4
CN5
CN7
REAR
CENTER
(X13-6640-00)
IC1(1/2)
IC1(2/2)
IC2(2/2)
IC2(1/2)
IC3
IC4
(X07-259X-XX)(A/4)
CENTER AMP
REAR AMP
IC4(1/2)
IC4(2/2)
CN14
W2
W3
CN1
W5
W14
SYNCRO

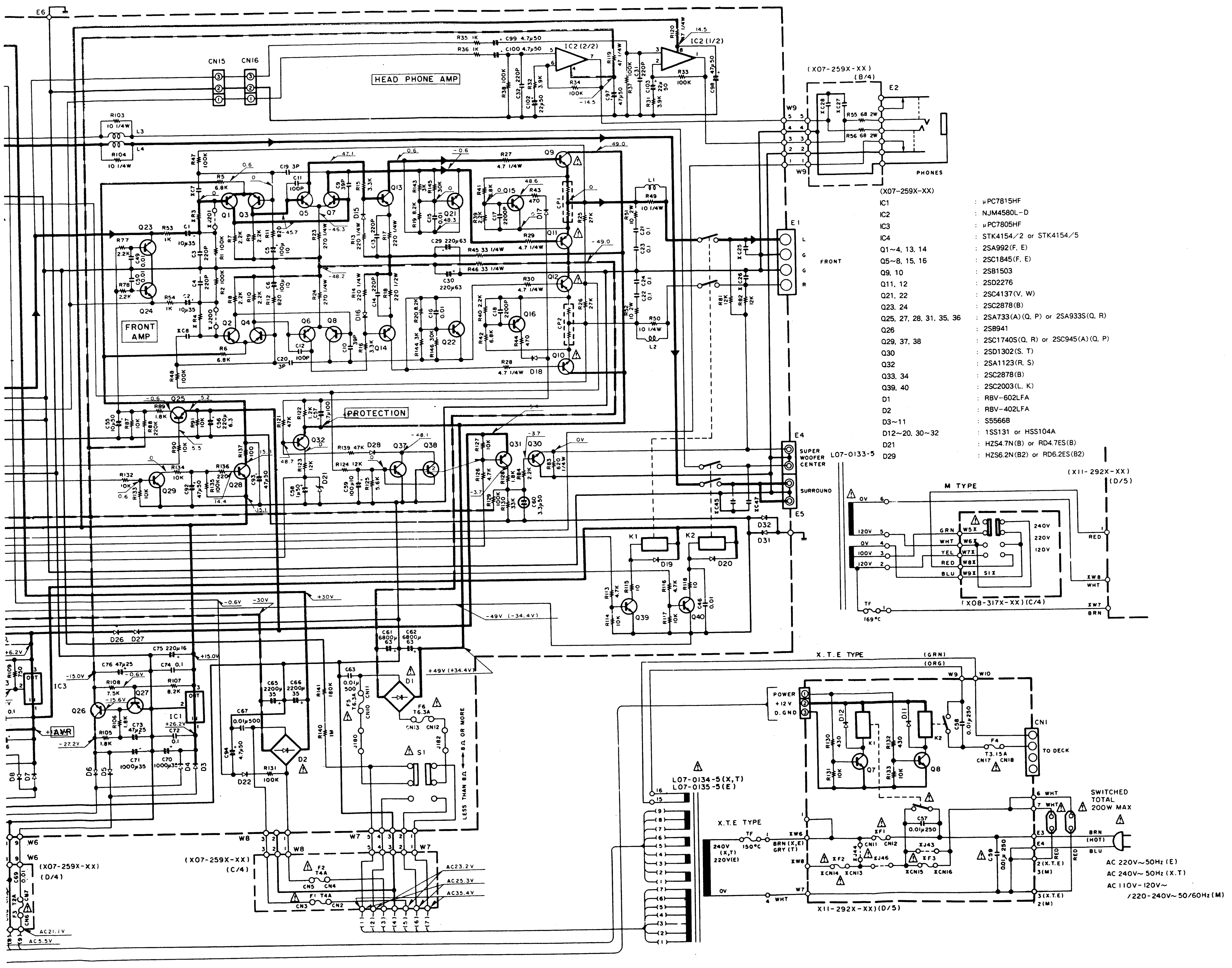
(X11-292X-XX)

DESTINATION	Ref. NO.	CN9, 10 13, 14	CN11, 12	CN15, 16	D5	D27~31	E5	F1	F2	F3	J43	J46	J47	R37, 38	R39, 40	R65	R110	R125, 126	S10	W6	W8
M	0-21	YES	YES	NO	YES	YES	YES	250V T4A	T2A	NO	YES	NO	NO	100	220K	620	5.6	100	YES	NO	YES
T	0-51	NO	YES	NO	NO	NO	NO	250V T2A	NO	NO	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO
X, E	2-71	NO	NO	YES	NO	NO	NO	250V T2A	NO	T2.5A	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO

(X13-6640-00)
IC1, 2 : NJM4665D-A
IC3 : TC74HC74AP
IC4 : TC74HC08AP
D1~5 : 1SS133 or HSS104

(X07 - 259X - XX)

DESTINATION \ Ref. NO.		C7, 8	C25, 26	C27, 28	C45, 47	F7	IC4	J71	J79, 200, 201	R3, 4
M	0 - 21	NO	NO	NO	NO	2A	STK4154/2	NO	YES	NO
X, T, E	2 - 71	100P	4700P	220P	2200P	T2A	STK4154/5	YES	NO	1k


HEAD PHONE AMP
CN15
CN16
IC2 (2/2)
IC2 (1/2)
FRONT AMP
PROTECTION
PHONES
FRONT
SUPER WOOFER CENTER
SURROUND
L07-0133-5
M TYPE
X.T.E TYPE
POWER
+12 V
D.GND
TO DECK
SWITCHED TOTAL 200W MAX
AC 220V~50Hz (E)
AC 240V~ 50Hz (X.T)
AC 110V-120V~ /220-240V~50/60Hz (M)
L07-0134-5 (X,T)
L07-0135-5 (E)
(X07-259X-XX) (B/4)
(X07-259X-XX) (C/4)
(X07-259X-XX) (D/4)
(X11-292X-XX) (D/5)
(X08-317X-XX) (C/4)
LESS THAN 8Ω ←→ 8Ω OR MORE
+49V (+34.4V)
-49V (-34.4V)
+30V
-30V
+15.0V
-15.0V
AC23.2V
AC25.3V
AC35.4V
AC21.1V
AC5.5V

(X07-259X-XX)

IC1	: μPC7815HF
IC2	: NJM4580L-D
IC3	: μPC7805HF
IC4	: STK4154/2 or STK4154/5
Q1~4, 13, 14	: 2SA992(F, E)
Q5~8, 15, 16	: 2SC1845(F, E)
Q9, 10	: 2SB1503
Q11, 12	: 2SD2276
Q21, 22	: 2SC4137(V, W)
Q23, 24	: 2SC2878(B)
Q25, 27, 28, 31, 35, 36	: 2SA733(A)(Q, P) or 2SA933S(Q, R)
Q26	: 2SB941
Q29, 37, 38	: 2SC1740S(Q, R) or 2SC945(A)(Q, P)
Q30	: 2SD1302(S, T)
Q32	: 2SA1123(R, S)
Q33, 34	: 2SC2878(B)
Q39, 40	: 2SC2003(L, K)
D1	: RBV-602LFA
D2	: RBV-402LFA
D3~11	: S5566B
D12~20, 30~32	: 1SS131 or HSS104A
D21	: HZS4.7N(B) or RD4.7ES(B)
D29	: HZS6.2N(B2) or RD6.2ES(B2)

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

▲ Others

DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

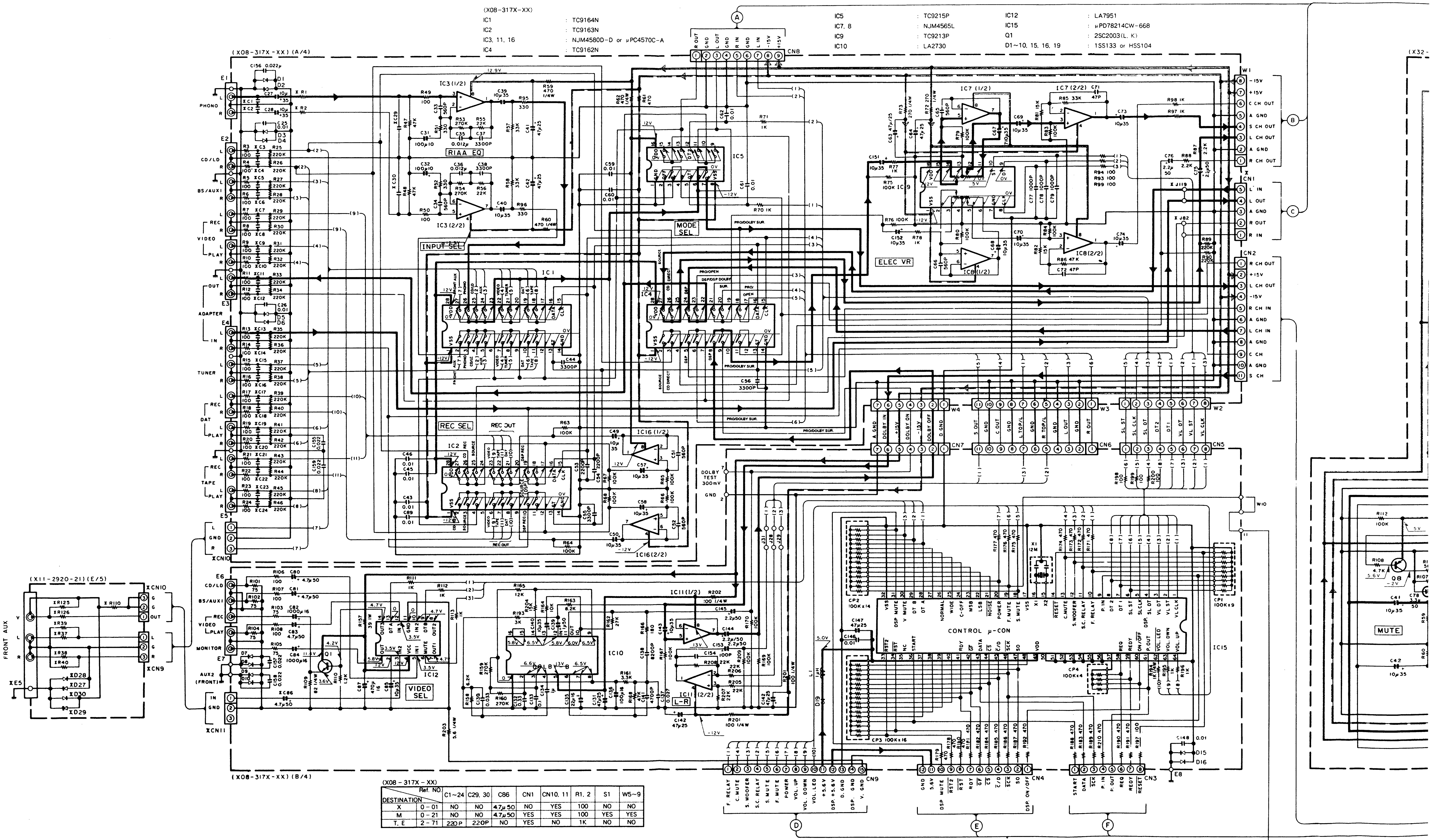
Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

Y08-4190-21

A-94

KENWOOD



(X08-317X-XX) (A/4)
(X08-317X-XX) (B/4)
(X11-2920-21) (E/5)
(X32-
PHONO
CD/LD
BS/AUX1
REC
VIDEO
PLAY
OUT
ADAPTER
IN
TUNER
DAT
TAPE
FRONT AUX
MONITOR
AUX2 (FRONT)
RIAA EQ
INPUT SEL
MODE SEL
REC SEL
REC OUT
ELEC VR
VIDEO SEL
L-R
CONTROL μ-CON
MUTE
IC1
IC2
IC3 (1/2)
IC3 (2/2)
IC4
IC5
IC7 (1/2)
IC7 (2/2)
IC8 (1/2)
IC8 (2/2)
IC9
IC10
IC11 (1/2)
IC11 (2/2)
IC12
IC15
IC16 (1/2)
IC16 (2/2)
PRO/DOLBY SUR.
DOLBY TEST 300mV
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
W1
W2
W3
W4
W10
E1
E2
E3
E4
E5
E6
E7
E8
R OUT
GND
L OUT
R IN
L IN
-15V
+15V
C CH OUT
A GND
S CH OUT
L CH OUT
R CH OUT
L IN
L OUT
R OUT
R IN
R CH OUT
L CH OUT
R CH IN
L CH IN
C CH
S CH
F. RELAY
C. MUTE
S. WOOFER
S.C. RELAY
S. MUTE
F. MUTE
POWER
VOL. UP
VOL. DOWN
VOL. LED
+5.6V
DSP. +5.6V
D. GND
DSP. GND
V. GND
GND
5.6V
DSP MUTE
RST2
RDY
START
DATA
SCK
P. IN
P. OUT
REQ
REDY
RESET
DSP. ON/OFF
CP1 100K×9
CP2 100K×14
CP3 100K×16
CP4 100K×4
X1 12M

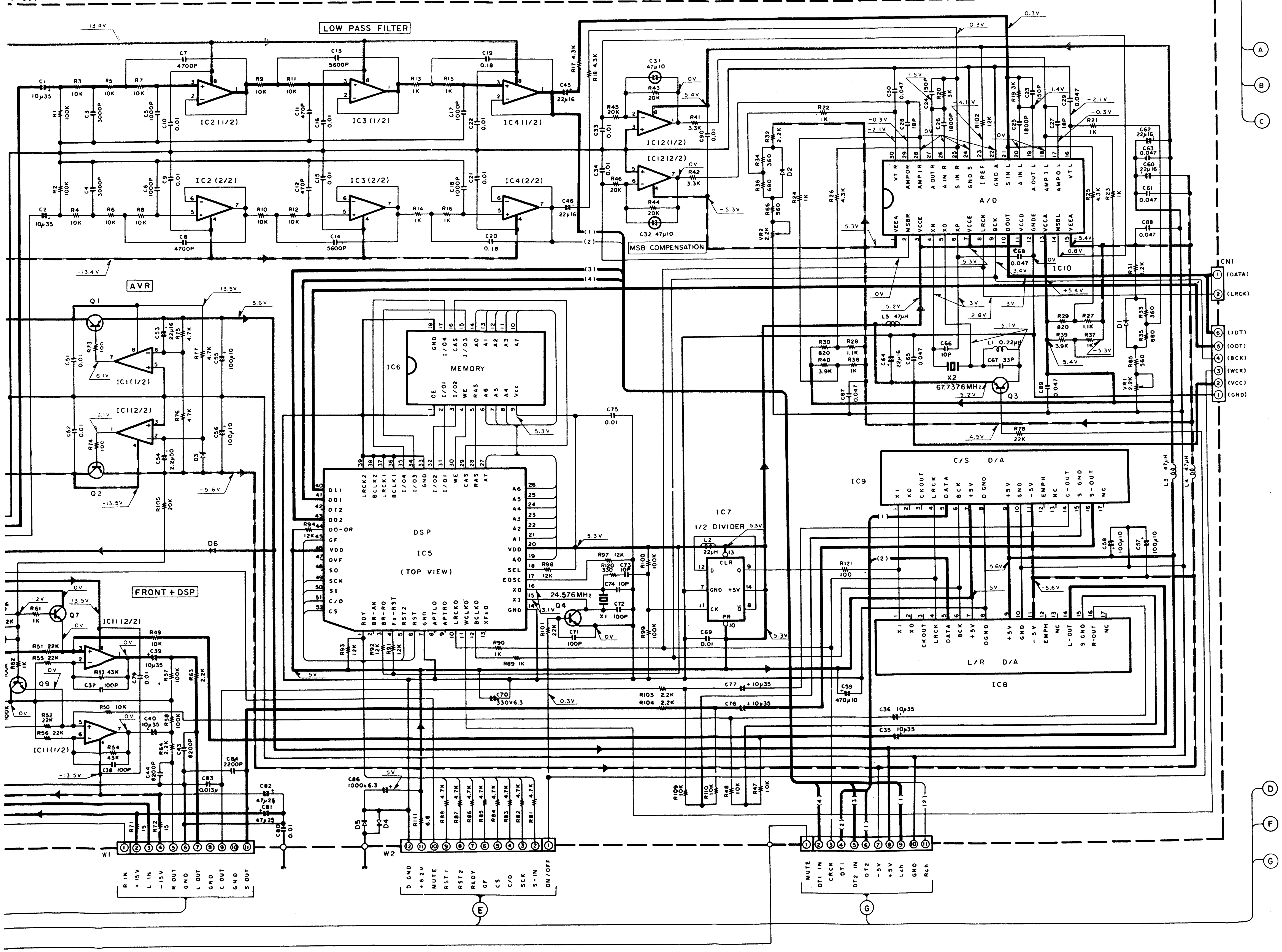
(X08-317X-XX)

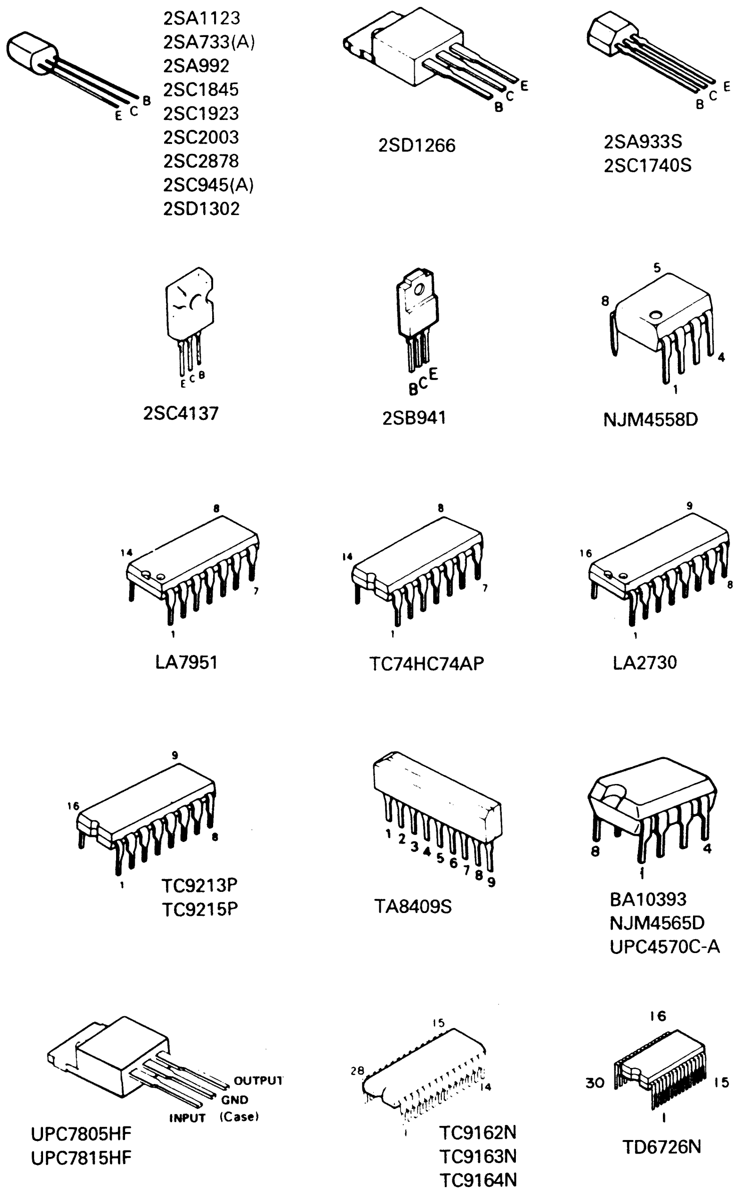
IC1	: TC9164N	IC5	: TC9215P	IC12	: LA7951
IC2	: TC9163N	IC7, 8	: NJM4565L	IC15	: μPD78214CW-668
IC3, 11, 16	: NJM4580D-D or μPC4570C-A	IC9	: TC9213P	Q1	: 2SC2003(L, K)
IC4	: TC9162N	IC10	: LA2730	D1~10, 15, 16, 19	: 1SS133 or HSS104

(X08 - 317X - XX)

DESTINATION	Ref. NO.	C1~24	C29, 30	C86	CN1	CN10, 11	R1, 2	S1	W5~9
X	0 - 01	NO	NO	4.7μ50	NO	YES	100	NO	NO
M	0 - 21	NO	NO	4.7μ50	YES	YES	100	YES	YES
T, E	2 - 71	220P	220P	NO	YES	NO	1K	NO	NO

(X32-1710-00)
IC1, 12 : NJM4558D
IC2~4, 11 : NJM4565D
IC5 : μPD6380GC-3BH
IC6 : HM50464RP-12 or LM33464G-12 or μPD41464CF-12
IC7 : TC74HC74AP
IC8, 9 : KAS03
IC10 : TD6726N
Q1 : 2SD1266(Q, P)
Q2 : 2SB941(Q, P)
Q3, 8 : 2SA733(A)(Q, P) or 2SA933S(Q, R)
Q4 : 2SC1923(R, O)
Q7, 9 : 2SD1302(S, T)
D1, 2, 4~6 : 1SS133 or HSS104
D3 : HZS5.6N(B2) or RD5.6ES(B2)


10-00)
LOW PASS FILTER
IC2(1/2)
IC3(1/2)
IC4(1/2)
IC2(2/2)
IC3(2/2)
IC4(2/2)
IC12(1/2)
IC12(2/2)
MSB COMPENSATION
A/D
IC10
AVR
Q1
Q2
IC1(1/2)
IC1(2/2)
IC6
MEMORY
DSP
IC5
(TOP VIEW)
24.576MHz
Q4
IC7
1/2 DIVIDER
67.7376MHz
X2
Q3
IC9
C/S D/A
IC8
L/R D/A
CN1
(DATA)
(LRCK)
(IDT)
(ODT)
(BCK)
(WCK)
(VCC)
(GND)
FRONT + DSP
Q7
Q9
IC11(2/2)
IC11(1/2)
D6
W1
W2
R IN
+15V
L IN
-15V
R OUT
GND
L OUT
GND
C OUT
GND
S OUT
D GND
+6.2V
MUTE
RST1
RST2
RLDY
GF
CS
C/D
SCK
S-IN
ON/OFF
MUTE
DT1 IN
CRCK
DT1
DT2 IN
DT2
-5V
+5V
Lch
GND
Rch
A
B
C
D
E
F
G


2SA1123
2SA733(A)
2SA992
2SC1845
2SC1923
2SC2003
2SC2878
2SC945(A)
2SD1302
E C B
2SD1266
B C E
2SA933S
2SC1740S
B C E
2SC4137
E C B
2SB941
B C E
NJM4558D
5
8
4
1
LA7951
14
8
1
7
TC74HC74AP
14
8
1
7
LA2730
16
9
1
8
TC9213P
TC9215P
16
9
1
8
TA8409S
1 2 3 4 5 6 7 8 9
BA10393
NJM4565D
UPC4570C-A
8
5
1
4
UPC7805HF
UPC7815HF
OUTPUT
GND
INPUT (Case)
TC9162N
TC9163N
TC9164N
28
15
1
14
TD6726N
16
30
15

CAUTION: **For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.**

▲ Others

DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

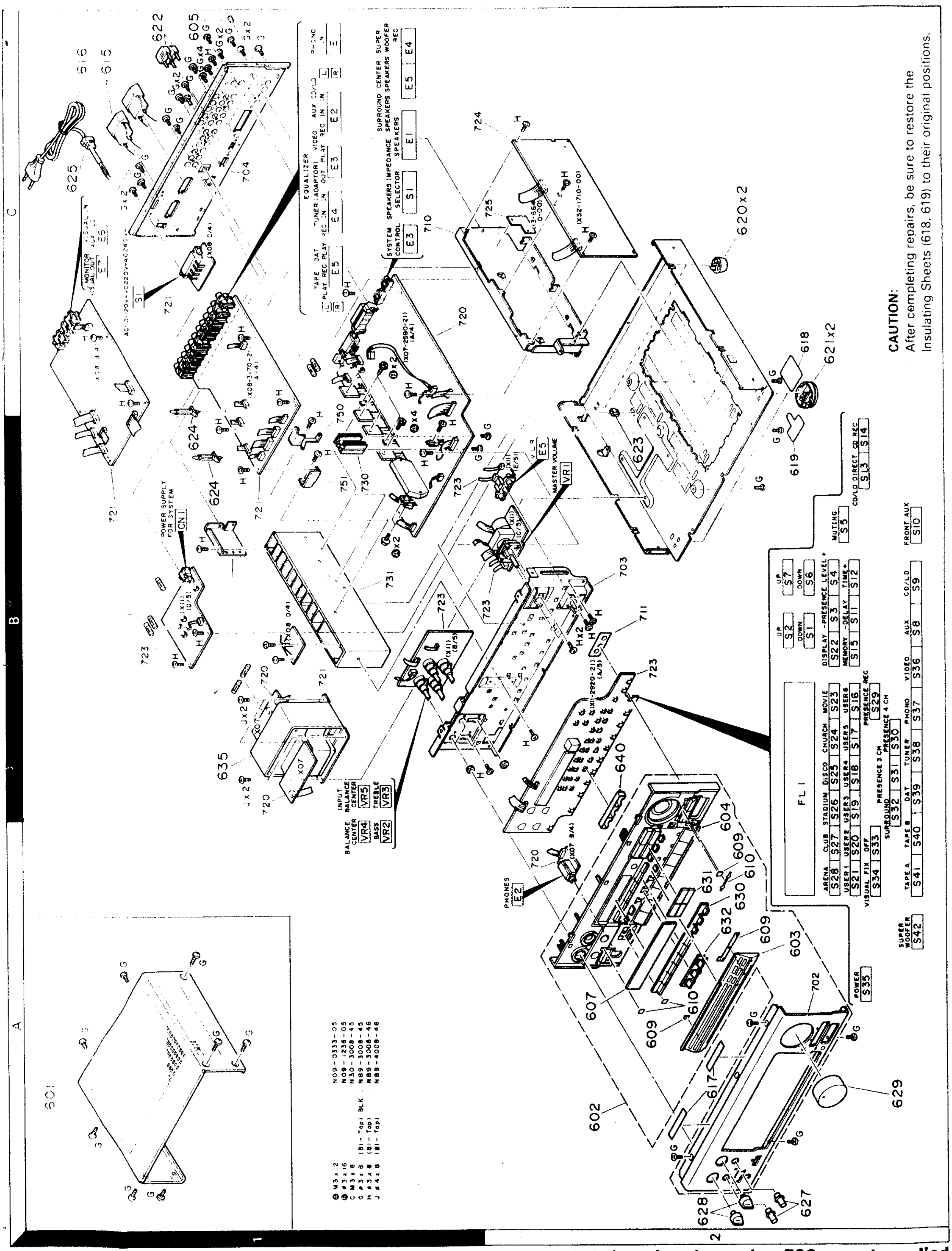
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

A-94

Y08-4190-21

KENWOOD

EXPLODED VIEW


601
602
603
604
605
607
609
610
615
616
617
618
619
620x2
621x2
622
623
624
625
627
628
629
630
631
632
635
640
702
703
704
710
711
720
721
723
724
725
730
731
750
751
A M3x12 N09-0333-05
B M3x16 N09-1236-05
C M3x8 N30-3008-45
G M3x8 (Bi-Tap) BLK N89-3008-46
H M3x8 (Bi-Tap) N89-3008-46
J M4x8 (Bi-Tap) N89-4008-46
MASTER VOLUME VR1
BALANCE CENTER VR4
INPUT BALANCE CENTER VR5
BASS VR2
TREBLE VR3
PHONES E2
POWER SUPPLY FOR SYSTEM CN1
V L R E5
SYSTEM CONTROL E3
SPEAKERS SELECTOR S1
FL1
POWER S35
SUPER WOOFER S42
MUTING S5
FRONT AUX S10
CD/LD DIRECT S13
CD REC S14

CAUTION:
After completing repairs, be sure to restore the Insulating Sheets (618, 619) to their original positions.

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

* New Parts
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Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
A-94						
601	1A		A01-1810-01	METALLIC CABINET		
602	2A	*	A20-6065-12	PANEL ASSY	M	
602	2A	*	A20-6080-12	PANEL ASSY	XTE	
603	2A	*	A21-1778-03	DRESSING PANEL		
604	2A	*	B01-0472-01	PANEL ESCUTCHEON		
605	1C		B09-0068-05	CAP		
607	2A	*	B10-1099-03	FRONT GLASS		
609	2A	*	B12-0145-04	INDICATOR		
610	2A	*	B12-0146-04	INDICATOR		
-			B46-0096-13	WARRANTY CARD	X	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-13	WARRANTY CARD	T	
615	1C		E03-0055-05	AC OUTLET	ME	
615	1C		E03-0085-05	AC OUTLET	T	
615	1C		E03-0114-05	AC OUTLET	X	
616	1C		E30-0459-05	AC POWER CORD	ME	
616	1C		E30-1341-05	AC POWER CORD	X	
616	1C		E30-1416-05	AC POWER CORD	T	
618	1C	*	F20-1305-04	INSULATING SHEET		
619	1C	*	F20-1306-04	INSULATING SHEET		
617	2A		G13-0439-04	CUSHION		
-		*	H01-8835-04	ITEM CARTON CASE		
-		*	H10-5041-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-5042-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0224-04	PROTECTION BAG (800X400X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)	XTE	
620	2C		J02-0366-15	FOOT		
621	2B,2C		J02-1040-05	FOOT		
622	1C		J12-0091-05	PIN		
623	2B		J19-3180-05	UNIT HOLDER		
624	1B	*	J19-3331-05	UNIT HOLDER		
625	1C		J42-0083-05	POWER CORD BUSHING		
-		*	J19-3324-05	UNIT HOLDER (X13)		
-			J61-0307-05	WIRE BAND		
627	2A		K29-3632-04	KNOB BASS,TREBLE		
628	2A		K29-3740-04	KNOB BALANCE		
629	2A		K29-3757-04	KNOB VOLUME		
630	2A	*	K29-3976-03	KNOB SOUND SELECTOR		
631	2A	*	K29-3977-03	KNOB VOLUME UP/DOWN(REA/CENT)		
632	2A	*	K29-3978-04	KNOB SURROUND,PRESENCE		
635	1B	*	L07-0133-05	POWER TRANSFORMER	M	
635	1B	*	L07-0134-05	POWER TRANSFORMER	XT	
635	1B	*	L07-0135-05	POWER TRANSFORMER	E	
G	1A,2A		N89-3008-45	BINDING HEAD TAPTITE SCREW		
H	1B,2B		N89-3008-46	BINDING HEAD TAPTITE SCREW		
J	1B		N89-4008-46	BINDING HEAD TAPTITE SCREW		
MAIN AMPLIFIER UNIT (X07-2590-21 : M, 2-71 : X, T, E)						
C1 ,2			CE04KW1V100M	ELECTRO 10UF 35WV		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		

E: Scandinavia & Europe K: USA P: Canada
Y: PX(Far East, Hawaii) T: England M: Other Areas
Y: AAFES(Europe) X: Australia

⚠ indicates safety critical components.

A-94

PARTS LIST

⁎ New Parts

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Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C5 ,6			CE04KW1A101M	ELECTRO 100UF 10WV		
C7 ,8			CC45FSL1H101J	CERAMIC 100PF J	XTE	
C9 ,10			CC45FSL1H390J	CERAMIC 39PF J		
C11 ,12			CC45FSL1H101J	CERAMIC 100PF J		
C13 ,14			CC45FSL1H221J	CERAMIC 220PF J		
C15 ,16			CK45FF1H103Z	CERAMIC 0.010UF Z		
C17 ,18			CF92FV1H222J	MF 2200PF J		
C19 ,20			CC45FSL1H030C	CERAMIC 3.0PF C		
C21 -24			CF92FV1H104J	MF 0.10UF J		
C25 ,26			CF92FV1H472J	MF 4700PF J	XTE	
C27 ,28			CC45FSL1H221J	CERAMIC 220PF J	XTE	
C29			CE04KW1J221M	ELECTRO 220UF 63WV		
C30			CE04KW1H221M	ELECTRO 220UF 50WV		
C31 ,32			CC45FSL1H221J	CERAMIC 220PF J		
C33 ,34			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C35 ,36			CF92FV1H471J	MF 470PF J		
C37 ,38			CE04KW1E330M	ELECTRO 33UF 25WV		
C39 ,40			CC45FSL1H101J	CERAMIC 100PF J		
C41 -44			CF92FV1H104J	MF 0.10UF J		
C45			CF92FV1H222J	MF 2200PF J	XTE	
C46			CK45FF1H103Z	CERAMIC 0.010UF Z		
C47			CF92FV1H222J	MF 2200PF J	XTE	
C49 ,50			CK45FF1H103Z	CERAMIC 0.010UF Z		
C51			CE04KW1H3R3M	ELECTRO 3.3UF 50WV		
C52			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C53			CE04KW1H3R3M	ELECTRO 3.3UF 50WV		
C54			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C55			CE04KW1H100M	ELECTRO 10UF 50WV		
C56			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C57			CE04KW2A4R7M	ELECTRO 4.7UF 100WV		
C58			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C59			CE04KW1A101M	ELECTRO 100UF 10WV		
C60			C90-1351-05	NP-ELEC 3.3UF 50WV		
C61 ,62		*	C90-1829-05	ELECTRO 6800UF 63WV		
C63			CK45FE2H103P	CERAMIC 0.010UF P		
C64			CF92FV1H104J	MF 0.10UF J		
C65 ,66			CE04KW1V222M	ELECTRO 2200UF 35WV		
C67			CK45FE2H103P	CERAMIC 0.010UF P		
C68			CE04KW1H220M	ELECTRO 22UF 50WV		
C69			CK45FF1H103Z	CERAMIC 0.010UF Z		
C70 ,71			CE04KW1V102M	ELECTRO 1000UF 35WV		
C72			CF92FV1H104J	MF 0.10UF J		
C73			CE04KW1E470M	ELECTRO 47UF 25WV		
C74			CF92FV1H104J	MF 0.10UF J		
C75			CE04KW1C221M	ELECTRO 220UF 16WV		
C76			CE04KW1E470M	ELECTRO 47UF 25WV		
C77			CK45FF1H103Z	CERAMIC 0.010UF Z		
C78			CE04KW1C471M	ELECTRO 470UF 16WV		
C79			CF92FV1H104J	MF 0.10UF J		
C80			CE04KW1E470M	ELECTRO 47UF 25WV		
C81			CE04KW1V221M	ELECTRO 220UF 35WV		
C82			CE04KW1H100M	ELECTRO 10UF 50WV		
C83 ,84			CF92FV1H473J	MF 0.047UF J		
C85 ,86			CC45FSL1H101J	CERAMIC 100PF J		
C87			CE04KW1H100M	ELECTRO 10UF 50WV		

E: Scandinavia & Europe	K: USA	P: Canada
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⚠ indicates safety critical components.

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PARTS LIST

⁎ New Parts
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Teile ohne **Parts No.** werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
C88 ,89			CE04KW1H101M	ELECTRO 100UF 50WV		
C90			CE04KW1HR47M	ELECTRO 0.47UF 50WV		
C91			C90-1334-05	NP-ELEC 47UF 10WV		
C92 ,93			CE04KW1H470M	ELECTRO 47UF 50WV		
C94			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C95 ,96			C91-0721-05	CERAMIC 10PF J		
C97 ,98			CE04KW1H470M	ELECTRO 47UF 50WV		
C99 ,100			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C101,102			CE04KW1H220M	ELECTRO 22UF 50WV		
E1			E20-0459-05	LOCK TERMINAL BOARD SPEAKERS		
E2			E11-0198-05	PHONE JACK PHONES		
E3		*	E08-0311-05	RECEPTACLE SYSTEM CONTROL		
E4			E13-0254-05	PHONO JACK WOOFER/CENTER SP		
E5			E13-0255-05	PHONO JACK SURROUND		
⚠ F1 ,2			F05-4025-05	FUSE (SEMKO) (250V T4A)		
⚠ F3 -6			F05-6321-05	FUSE (SEMKO) (250V T6.3A)		
F7			F53-0019-05	FUSE		
-			J61-0307-05	LEAD BAND		
CN2 -13			J13-0075-05	FUSE CLIP		
L1 -4			L39-0085-05	PHASE-COMPENSATION COIL		
A	1B		N09-0333-05	TAPPING SCREW (3X12)		
B	1C		N09-1236-05	TAPPING SCREW (3X16)		
C	1B		N30-3006-46	PAN HEAD MACHINE SCREW		
G	1B,2B		N89-3008-45	BINDING HEAD TAPTITE SCREW		
H	1B		N89-3008-46	BINDING HEAD TAPTITE SCREW		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R13 ,14			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R15 ,16			RD14AB2E332J	FL-PROOF RD 3.3K J 1/4W		
R17 ,18			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R23 ,24			RD14AB2E271J	FL-PROOF RD 270 J 1/4W		
R27 -30			RD14AB2E4R7J	FL-PROOF RD 4.7 J 1/4W		
R45 ,46			RD14AB2E330J	FL-PROOF RD 33 J 1/4W		
R49 ,50			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R51 ,52			RS14DB3D100J	FL-PROOF RS 10 J 2W		
R55 ,56			RS14DB3D680J	FL-PROOF RS 68 J 2W		
R67 ,68			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R71 ,72			RS14DB3D100J	FL-PROOF RS 10 J 2W		
R103,104			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
R110			RD14AB2E1R0J	FL-PROOF RD 1.0 J 1/4W		
R111			R92-0341-05	FL-PROOF RD 1.0 J 1/4W		
R112			RD14AB2E152J	FL-PROOF RD 1.5K J 1/4W		
R119,120			RD14GB2E470J	FL-PROOF RD 47 J 1/4W		
R138			RS14DB3D390J	FL-PROOF RS 39 J 2W		
K1 ,2			S51-2093-05	MAGNETIC RELAY		
S1			S31-2136-05	SLIDE SWITCH IMPEDANCE SELECT		
D1			RBV-602LFA	DIODE		
D2			RBV-402LFA	DIODE		
D3 -11			S5566B	DIODE		
D12 -20			HSS104A	DIODE		
D12 -20			1SS131	DIODE		
D21			HZS4.7N(B)	ZENER DIODE		
D21			RD4.7ES(B)	ZENER DIODE		

E: Scandinavia & Europe K: USA P: Canada
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PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
D22 -28			HSS104A	DIODE		
D22 -28			1SS131	DIODE		
D29			HZS6.8N(B2)	ZENER DIODE		
D29			RD6.8ES(B2)	ZENER DIODE		
D30 -33			HSS104A	DIODE		
D30 -33			1SS131	DIODE		
IC1			UPC7815HF	IC(VOLTAGE REGULATOR/ +15V)		
IC2		*	NJM4580L-D	IC		
IC3			UPC7805HF	IC(VOLTAGE REGULATOR/ +5V)		
IC4			STK4154/2	IC	M	
IC4		*	STK4154/5	IC	XTE	
Q1 -4			2SA992(F,E)	TRANSISTOR		
Q5 -8			2SC1845(F,E)	TRANSISTOR		
Q9 ,10		*	2SD2276	TRANSISTOR		
Q11 ,12		*	2SB1503	TRANSISTOR		
Q13 ,14			2SA992(F,E)	TRANSISTOR		
Q15 ,16			2SC1845(F,E)	TRANSISTOR		
Q21 ,22			2SC4137(V,W)	TRANSISTOR		
Q23 ,24			2SC2878(B)	TRANSISTOR		
Q25			2SA733(A)(Q,P)	TRANSISTOR		
Q25			2SA933S(Q,R)	TRANSISTOR		
Q26			2SB941	TRANSISTOR		
Q27 ,28			2SA733(A)(Q,P)	TRANSISTOR		
Q27 ,28			2SA933S(Q,R)	TRANSISTOR		
Q29			2SC1740S(Q,R)	TRANSISTOR		
Q29			2SC945(A)(Q,P)	TRANSISTOR		
Q30			2SD1302(S,T)	TRANSISTOR		
Q31			2SA733(A)(Q,P)	TRANSISTOR		
Q31			2SA933S(Q,R)	TRANSISTOR		
Q32			2SA1123(R,S)	TRANSISTOR		
Q33 ,34			2SC2878(B)	TRANSISTOR		
Q35 ,36			2SA733(A)(Q,P)	TRANSISTOR		
Q35 ,36			2SA933S(Q,R)	TRANSISTOR		
Q37 ,38			2SC1740S(Q,R)	TRANSISTOR		
Q37 ,38			2SC945(A)(Q,P)	TRANSISTOR		
Q39 ,40			2SC2003(L,K)	TRANSISTOR		
PREAMPLIFIER UNIT (X08-3170-21 : M, 0-01 : X, 2-71 : T, E)						
C1 ,2			C91-0749-05	CERAMIC 220PF K	TE	
C3 -24			CC45FSL1H221J	CERAMIC 220PF J	TE	
C25 ,26			C91-0769-05	CERAMIC 0.01UF K		
C27 ,28			CE04KW1V100M	ELECTRO 10UF 35WV		
C29 ,30			CC45FSL1H221J	CERAMIC 220PF J	TE	
C31 ,32			CE04KW1A101M	ELECTRO 100UF 10WV		
C33 ,34			CK45FB1H561K	CERAMIC 560PF K		
C35 ,36			CF92FV1H123J	MF 0.012UF J		
C37 ,38			CF92FV1H332J	MF 3300PF J		
C39 ,40			CE04KW1V100M	ELECTRO 10UF 35WV		
C41 ,42			CE04KW1E470M	ELECTRO 47UF 25WV		
C43			CK45FF1H103Z	CERAMIC 0.010UF Z		
C44			CK45FB1H332K	CERAMIC 3300PF K		
C45 ,46			CK45FF1H103Z	CERAMIC 0.010UF Z		
C49 ,50			CE04KW1V100M	ELECTRO 10UF 35WV		
C51 ,52			CK45FB1H561K	CERAMIC 560PF K		
C53 ,54			CK45FB1H222K	CERAMIC 2200PF K		

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PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C55 ,56			CK45FB1H332K	CERAMIC 3300PF K		
C57 ,58			CE04KW1V100M	ELECTRO 10UF 35WV		
C59 ,60			CK45FF1H103Z	CERAMIC 0.010UF Z		
C61 ,62			C91-0769-05	CERAMIC 0.01UF K		
C63 ,64			CE04KW1E470M	ELECTRO 47UF 25WV		
C65 ,66			CK45FB1H561K	CERAMIC 560PF K		
C67 -70			CE04KW1V100M	ELECTRO 10UF 35WV		
C71 ,72			CC45FSL1H470J	CERAMIC 47PF J		
C73 ,74			CE04KW1V100M	ELECTRO 10UF 35WV		
C75 ,76			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C77 -79			CK45FB1H102K	CERAMIC 0.001UF K		
C80 ,81			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C82			CE04KW1C102M	ELECTRO 1000UF 16WV		
C83			CE04KW1H4R7M	ELECTRO 4.7UF 50WV		
C84			CE04KW1C102M	ELECTRO 1000UF 16WV		
C85			CE04KW1V100M	ELECTRO 10UF 35WV		
C86			CE04KW1H4R7M	ELECTRO 4.7UF 50WV	MX	
C87			CE04KW1C471M	ELECTRO 470UF 16WV		
C89			CK45FF1H103Z	CERAMIC 0.010UF Z		
C130			CF92FV1H333J	MF 0.033UF J		
C131			CE04KW1E470M	ELECTRO 47UF 25WV		
C132			CF92FV1H334J	MF 0.33UF J		
C133			CF92FV1H104J	MF 0.10UF J		
C134			CF92FV1H105J	MF 1.0UF J		
C135			CE04KW1C220M	ELECTRO 22UF 16WV		
C136			CE04KW1C101M	ELECTRO 100UF 16WV		
C137			CF92FV1H273J	MF 0.027UF J		
C138			CF92FV1H822J	MF 8200PF J		
C139			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C140			CE04KW1V100M	ELECTRO 10UF 35WV		
C141			CF92FV1H472J	MF 4700PF J		
C142			CE04KW1E470M	ELECTRO 47UF 25WV		
C143			CE04KW1V100M	ELECTRO 10UF 35WV		
C144,145			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C146			C91-0769-05	CERAMIC 0.01UF K		
C147			CE04KW1E470M	ELECTRO 47UF 25WV		
C148			CK45FF1H103Z	CERAMIC 0.010UF Z		
C151,152			CE04KW1V100M	ELECTRO 10UF 35WV		
C153			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C154			CC45FSL1H101J	CERAMIC 100PF J		
C155-158			CK45FF1H223Z	CERAMIC 0.022UF Z		
C159			C91-0085-05	CERAMIC 0.022UF N		
C160			CK45FF1H103Z	CERAMIC 0.010UF Z		
E1			E13-0249-05	PHONO JACK PHONO		
E2			E13-0633-05	PHONO JACK CD/LD BS/AUX		
E3			E13-0445-05	PHONO JACK VIDEO/PLAY ADAPTER		
E4 ,5			E13-0633-05	PHONO JACK TUNER DAT TAPE		
E6			E13-0313-05	PHONO JACK LD/CD BS/AUX1 VIDE		
E7			E13-0297-05	PHONO JACK MONITOR		
L1			L40-1091-17	SMALL FIXED INDUCTOR		
X1		*	L78-0277-05	RESONATOR 12MHz		
CP1			R90-0493-05	MULTI-COMP 100KX9 J 1/6W		
CP2		*	R90-0864-05	MULTIPLE RESISTOR		

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CP3			R90-0859-05	MULTIPLE RESISTOR		
CP4			R90-0482-05	MULTI-COMP 100KX4 J 1/6W		
R59 ,60			RD14GB2E471J	FL-PROOF RD 470 J 1/4W		
R123			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
R125			RD14GB2E151J	FL-PROOF RD 150 J 1/4W		
R157			RS14KB3A390J	FL-PROOF RS 39 J 1W		
R203			RD14GB2E5R6J	FL-PROOF RD 5.6 J 1/4W		
S1			S31-2322-05	SLIDE SWITCH	M	
D1 -10			HSS104	DIODE		
D1 -10			1SS133	DIODE		
D15 ,16			HSS104	DIODE		
D15 ,16			1SS133	DIODE		
D19			HSS104	DIODE		
D19			1SS133	DIODE		
IC1			TC9164N	IC(16CH BILATERAL SELECTOR SW)		
IC2			TC9163N	IC(BILATERAL SWITCH X16)		
IC3			NJM4580D-D	IC		
IC3			UPC4570C-A	IC		
IC4			TC9162N	IC(ANALOG SWITCH ARRAY)		
IC5			TC9215P	IC(ANALOG SWITCH X 6)		
IC7 ,8			NJM4565L	IC		
IC9			TC9213P	IC(2CH ELECTRONIC VOLUME)		
IC10			LA2730	IC(DOLBY SYSTEM)		
IC11			NJM4580D-D	IC		
IC11			UPC4570C-A	IC		
IC12		*	LA7951	IC(AV SELECTOR)		
IC15		*	UPD78214CW-668	IC		
IC16			NJM4580D-D	IC		
IC16			UPC4570C-A	IC		
Q1			2SC2003(L,K)	TRANSISTOR		
CONTROL UNIT (X11-292X-XX)						
640	2A,2B	*	A33-0116-04	REFLECTOR		
D1 -4			B30-1289-05	LED	XTE	
D1 -5			B30-1289-05	LED	M	
D6 ,7			B30-1291-05	LED		
D8 ,9			B30-1289-05	LED		
D10			B30-1291-05	LED		
PL1 -3		*	B30-1297-05	LAMP		
C1 ,2			CE04KW1H3R3M	ELECTRO 3.3UF 50WV		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		
C5 ,6			CK45FB1H561K	CERAMIC 560PF K		
C7 ,8			CF92FV1H563J	MF 0.056UF J		
C9 ,10			CK45FB1H561K	CERAMIC 560PF K		
C11 ,12			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C13 ,14			CE04KW1V100M	ELECTRO 10UF 35WV		
C15 ,16			CF92FV1H203J	MF 0.020UF J		
C17 -20			CE04KW1V100M	ELECTRO 10UF 35WV		
C21 ,22			CE04KW1A101M	ELECTRO 100UF 10WV		
C31			CF92FV1H104J	MF 0.10UF J		
C32			CE04JW1A101M	ELECTRO 100UF 10WV		
C33			CE04JW1V4R7M	ELECTRO 4.7UF 35WV		
C34			CE04JW1A101M	ELECTRO 100UF 10WV		

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C35			C90-1827-05	BACKUP 0.047F 5.5WV		
C36 ,37			C91-0769-05	CERAMIC 0.01UF K		
C38			CE04JW1A101M	ELECTRO 100UF 10WV		
C39 ,40			CE04JW1H100M	ELECTRO 10UF 50WV		
C41			C91-0769-05	CERAMIC 0.01UF K		
C51 -54			CE04KW1E470M	ELECTRO 47UF 25WV		
C55			CE04KW1E101M	ELECTRO 100UF 25WV		
C56			C90-1333-05	NP-ELEC 22UF 10WV		
⚠ C57			C91-0971-05	FILM 0.01UF 250WV		
C58			CK45FF1H103Z	CERAMIC 0.010UF Z		
⚠ C59			C91-1421-05	FILM 0.01UF 250AC		
CN1			E08-0411-05	RECTANGULAR RECEPTACLE		
E5			E13-0311-05	PHONO JACK FRONT AUX	M	
⚠ F1			F05-4025-05	FUSE (SEMKO) (250V T4A)	M	
⚠ F1			F06-2021-05	FUSE (SEMKO) (250V T2A)	X	
⚠ F1 ,2			F06-2021-05	FUSE (SEMKO) (250V T2A)	TE	
⚠ F2			F06-2021-05	FUSE (SEMKO) (250V T2A)	M	
⚠ F3			F05-2525-05	FUSE (SEMKO) (250V T2.5A)	XE	
⚠ F4			F05-3121-05	FUSE (SEMKO) (250V T3.15A)		
CN11-14			J13-0075-05	FUSE CLIP	MT	
CN11,12			J13-0075-05	FUSE CLIP	XE	
CN15-18			J13-0075-05	FUSE CLIP	XE	
CN17,18			J13-0075-05	FUSE CLIP	MT	
X1			L78-0218-05	RESONATOR 4.19MHz		
CP1			R90-0816-05	MULTIPLE RESISTOR		
CP2			R90-0850-05	MULTIPLE RESISTOR		
CP3			R90-0482-05	MULTI-COMP 100KX4 J 1/6W		
R121,122			RD14GB2E121J	FL-PROOF RD 120 J 1/4W		
R123,124			RD14GB2E101J	FL-PROOF RD 100 J 1/4W		
R127,128			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
VR1		*	R29-5044-05	POTENTIOMETER MASTER VOLUME		
VR2 ,3			R06-3068-05	POTENTIOMETER BASS,TREBLE		
VR4		*	R01-5077-05	POTENTIOMETER BALANCE		
VR5		*	R01-5076-05	POTENTIOMETER INPUT BALANCE		
⚠ K1			S51-1052-05	MAGNETIC RELAY		
⚠ K2			S51-2094-05	MAGNETIC RELAY		
S1 -42			S40-1064-05	PUSH SWITCH	M	
S1 -9			S40-1064-05	PUSH SWITCH	XTE	
S11 -42			S40-1064-05	PUSH SWITCH	XTE	
D11 ,12			HSS104A	DIODE		
D11 ,12			1SS131	DIODE		
D13 -26			HSS104	DIODE	XTE	
D13 -26			1SS133	DIODE	XTE	
D13 -31			HSS104	DIODE	M	
D13 -31			1SS133	DIODE	M	
D31			HSS104	DIODE	XTE	
D31			1SS133	DIODE	XTE	
D32			HZS5.1N(B2)	ZENER DIODE		
D32			RD5.1ES(B2)	ZENER DIODE		
D33 ,34			HZS2.7N(B2)	ZENER DIODE		
D33 ,34			RD2.7ES(B2)	ZENER DIODE		
FL1		*	10-BT-68GK	FLUORESCENT INDICATOR TUBE		

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IC1		*	CXP50112-154Q	IC		
IC2		*	AN6914	IC		
IC2			BA10393	IC(DUAL COMPALATOR)		
IC3			NJM4580D-D	IC		
IC3			UPC4570C-A	IC		
IC4			TA8409S	IC(MOTOR CONTROL)		
IC5			NJM4580D-D	IC		
IC5			UPC4570C-A	IC		
Q1 -6			2SC1740S(Q,R)	TRANSISTOR		
Q1 -6			2SC945(A)(Q,P)	TRANSISTOR		
Q7 ,8			2SC2003(L,K)	TRANSISTOR		
A1			W02-0776-05	ELECTRIC CIRCUIT MODULE		
A1		*	W02-1046-05	ELECTRIC CIRCUIT MODULE		

DSP SUB UNIT (X13-6640-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
C4			CE04JW1C4R7M	ELECTRO 4.7UF 16WV		
C7 -9			CE04JW1C100M	ELECTRO 10UF 16WV		
C10 -12			CE04JW1C470M	ELECTRO 47UF 16WV		
C13 ,14			C91-0769-05	CERAMIC 0.01UF K		
C15 ,16			CC45FSL1H221J	CERAMIC 220PF J		
D1 -5			HSS104	DIODE		
D1 -5			1SS133	DIODE		
IC1 ,2			NJM4580D-D	IC		
IC1 ,2			UPC4570C-A	IC		
IC3			TC74HC74AP	IC(DUAL D-TYPE FLIP FLOP)		
IC4			TC74HC08AP	IC		

SIGNAL PROCESSOR UNIT (X32-1710-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
C1 ,2			CE04KW1V100M	ELECTRO 10UF 35WV		
C3 ,4			CF92FV1H302J	MF 3000PF J		
C5 ,6			CF92FV1H102J	MF 1000PF J		
C7 ,8			CF92FV1H472J	MF 4700PF J		
C9 ,10			CK45FF1H103Z	CERAMIC 0.010UF Z		
C11 ,12			CF92FV1H471J	MF 470PF J		
C13 ,14			CF92FV1H562J	MF 5600PF J		
C15 ,16			CK45FF1H103Z	CERAMIC 0.010UF Z		
C17 ,18			CF92FV1H102J	MF 1000PF J		
C19 ,20			CF92FV1H184J	MF 0.18UF J		
C21 ,22			CK45FF1H103Z	CERAMIC 0.010UF Z		
C23 ,24			CC45FSL1H151J	CERAMIC 150PF J		
C25 ,26			CQ09FS1H182J	POLYSTY 1800PF J		
C27 ,28			CC45FSL1H180J	CERAMIC 18PF J		
C29 ,30			CK45FF1H473Z	CERAMIC 0.047UF Z		
C31 ,32			C90-1334-05	NP-ELEC 47UF 10WV		
C33 ,34			CK45FF1H103Z	CERAMIC 0.010UF Z		
C35 ,36			CE04KW1V100M	ELECTRO 10UF 35WV		
C37 ,38			CC45FSL1H101J	CERAMIC 100PF J		
C39 -42			CE04KW1V100M	ELECTRO 10UF 35WV		
C43 ,44			CF92FV1H822J	MF 8200PF J		
C45 ,46			CE04KW1C220M	ELECTRO 22UF 16WV		
C51 ,52			CK45FF1H103Z	CERAMIC 0.010UF Z		
C53			CE04KW1C220M	ELECTRO 22UF 16WV		
C54			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C55 -58			CE04KW1A101M	ELECTRO 100UF 10WV		
C59			CE04KW1A471M	ELECTRO 470UF 10WV		

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C60			CE04KW1C220M	ELECTRO 22UF 16WV		
C61			CK45FF1H473Z	CERAMIC 0.047UF Z		
C62			CE04KW1C220M	ELECTRO 22UF 16WV		
C63			CK45FF1H473Z	CERAMIC 0.047UF Z		
C64			CE04KW1C220M	ELECTRO 22UF 16WV		
C65			CK45FF1H473Z	CERAMIC 0.047UF Z		
C66			CC45FCH1H100D	CERAMIC 10PF D		
C67			CC45FCH1H330J	CERAMIC 33PF J		
C68			CK45FF1H473Z	CERAMIC 0.047UF Z		
C69			CK45FF1H103Z	CERAMIC 0.010UF Z		
C70			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C71 ,72			CC45FSL1H101J	CERAMIC 100PF J		
C73 ,74			CC45FCH1H100D	CERAMIC 10PF D		
C75			CK45FF1H103Z	CERAMIC 0.010UF Z		
C76 ,77			CE04KW1V100M	ELECTRO 10UF 35WV		
C78			C90-1351-05	NP-ELEC 3.3UF 50WV		
C79 ,80			CK45FF1H103Z	CERAMIC 0.010UF Z		
C81 ,82			CE04KW1E470M	ELECTRO 47UF 25WV		
C83			CF92FV1H133J	MF 0.013UF J		
C84			CF92FV1H222J	MF 2200PF J		
C86			CE04DW0J102M	ELECTRO 1000UF 6.3WV		
C87 -89			CK45FF1H473Z	CERAMIC 0.047UF Z		
C90			CK45FF1H103Z	CERAMIC 0.010UF Z		
L1			L40-2281-17	SMALL FIXED INDUCTOR		
L2 -5			L40-3301-17	SMALL FIXED INDUCTOR(33UH,K)		
X1			L77-1125-05	CRYSTAL RESONATOR 24.576MHz		
X2			L77-1128-05	CRYSTAL RESONATOR 67.7376MHz		
R71 ,72			RD14GB2E150J	FL-PROOF RD 15 J 1/4W		
R111			RD14GB2E6R8J	FL-PROOF RD 6.8 J 1/4W		
VR1 ,2			R12-1086-05	TRIM POT. 1K		
D1 ,2			HSS104	DIODE		
D1 ,2			1SS133	DIODE		
D3			HZS5.6N(B2)	ZENER DIODE		
D3			RD5.6ES(B2)	ZENER DIODE		
D4 -6			HSS104	DIODE		
D4 -6			1SS133	DIODE		
IC1			NJM4558D	IC(OP AMP X2)		
IC2 -4			NJM4565D	IC(OP AMP X2)		
IC5		*	UPD6380GC-3BH	IC(DIGITAL SIGNAL PROCESSOR)		
IC6		*	HM50464RP-12	IC		
IC6		*	LM33464G-12	IC		
IC6		*	UPD41464CF-12	IC		
IC7			TC74HC74AP	IC(DUAL D-TYPE FLIP FLOP)		
IC8 ,9		*	KAS03	IC		
IC10		*	TD6726N	IC(16BIT A/D CONVERTER)		
IC11			NJM4565D	IC(OP AMP X2)		
IC12			NJM4558D	IC(OP AMP X2)		
Q1			2SD1266(Q,P)	TRANSISTOR		
Q2			2SB941(Q,P)	TRANSISTOR		
Q3			2SA733(A)(Q,P)	TRANSISTOR		
Q3			2SA933S(Q,R)	TRANSISTOR		
Q4			2SC1923(R,O)	TRANSISTOR		
Q7			2SD1302(S,T)	TRANSISTOR		
Q8			2SA733(A)(Q,P)	TRANSISTOR		

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Q8			2SA933S(Q,R)	TRANSISTOR		
Q9			2SD1302(S,T)	TRANSISTOR		

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SPECIFICATIONS

Continuous power output	
(Front)	
DIN at 1 kHz 8 Ω	75 W + 75 W
IEC/NF at 8 Ω	75 W + 75 W
(Center)	
(IHF '66) 1 kHz, 0.7% T.H.D. at 8 Ω	35 W
(Rear)	
(IHF '66) 1 kHz, 0.7% T.H.D. at 8 Ω	25 W + 25 W
Total harmonic distortion at 1/2 rated power	0.02%
Signal to noise ratio (IHF '66)	
PHONO (MM)	78 dB
CD, TUNER, AUX, TAPE	98 dB
Signal to noise ratio (DIN at 50 mW output)	
PHONO (MM)	59 dB
CD, TUNER, AUX, TAPE	60 dB
Input sensitivity/Impedance	
PHONO (MM)	2.5 mV/47 kΩ
CD, TUNER, AUX, TAPE	200 mV/47 kΩ
Frequency response	
(20 Hz to 70,000 Hz)	+0 dB, −3 dB
Tone Controls	
BASS	±10 dB (at 100 Hz)
TREBLE	±10 dB (at 10 kHz)
Output level/Impedance	
TAPE REC	200 mV/3.3 kΩ
General	
Power consumption	260 W
Dimension	W: 360 mm H: 129 mm D: 375 mm
Weight (net)	9.1 kg

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Le système de réduction du bruit de fond est fabriqué sous license des Dolby Laboratories.

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Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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